A. GALLERANI.

MACARONI DRYING APPARATUS.

APPLICATION FILED MAY 13, 1916.

1,217,439.

Patented Feb. 27, 1917.

2 SHEETS—SHEET 1.

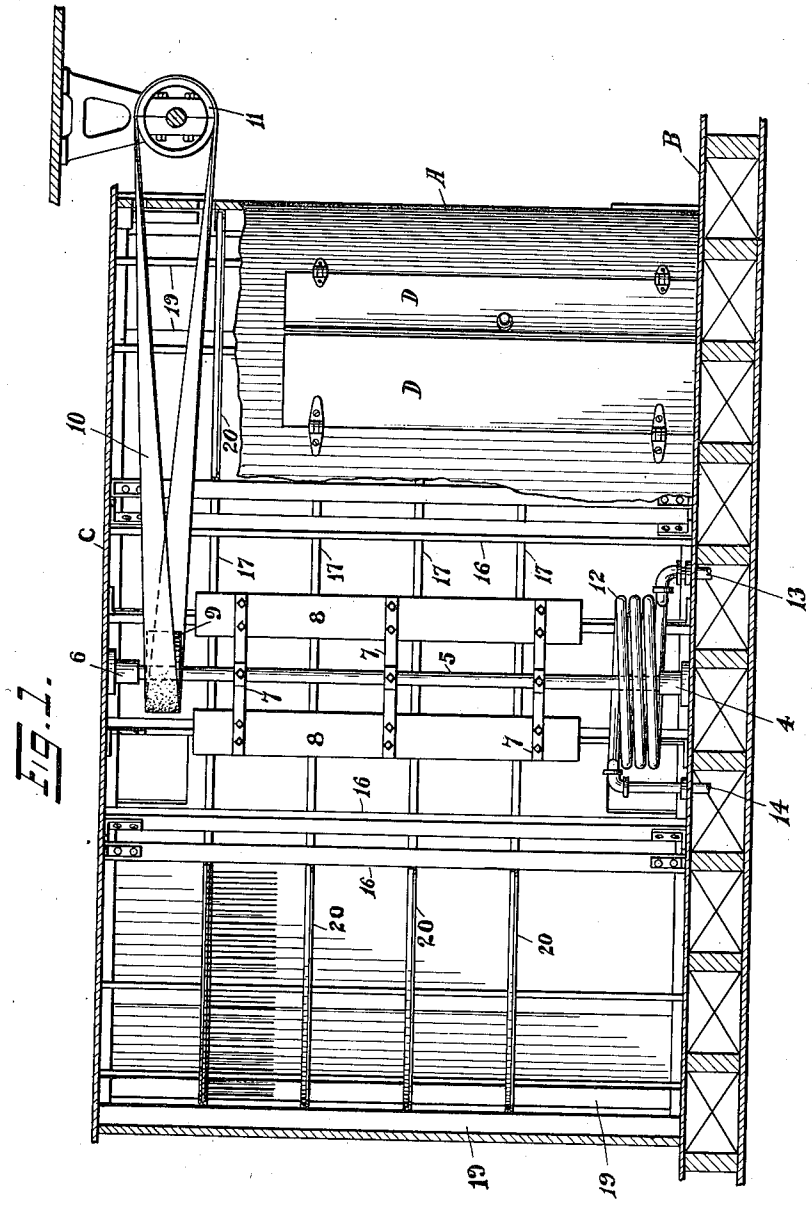



Fig. 1.

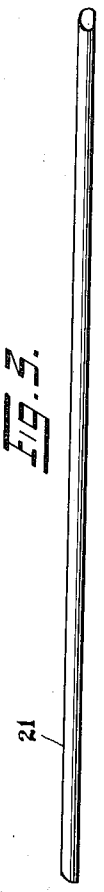



Fig. 2.

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Inventor:
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By his Att'y, F. W. Richard.

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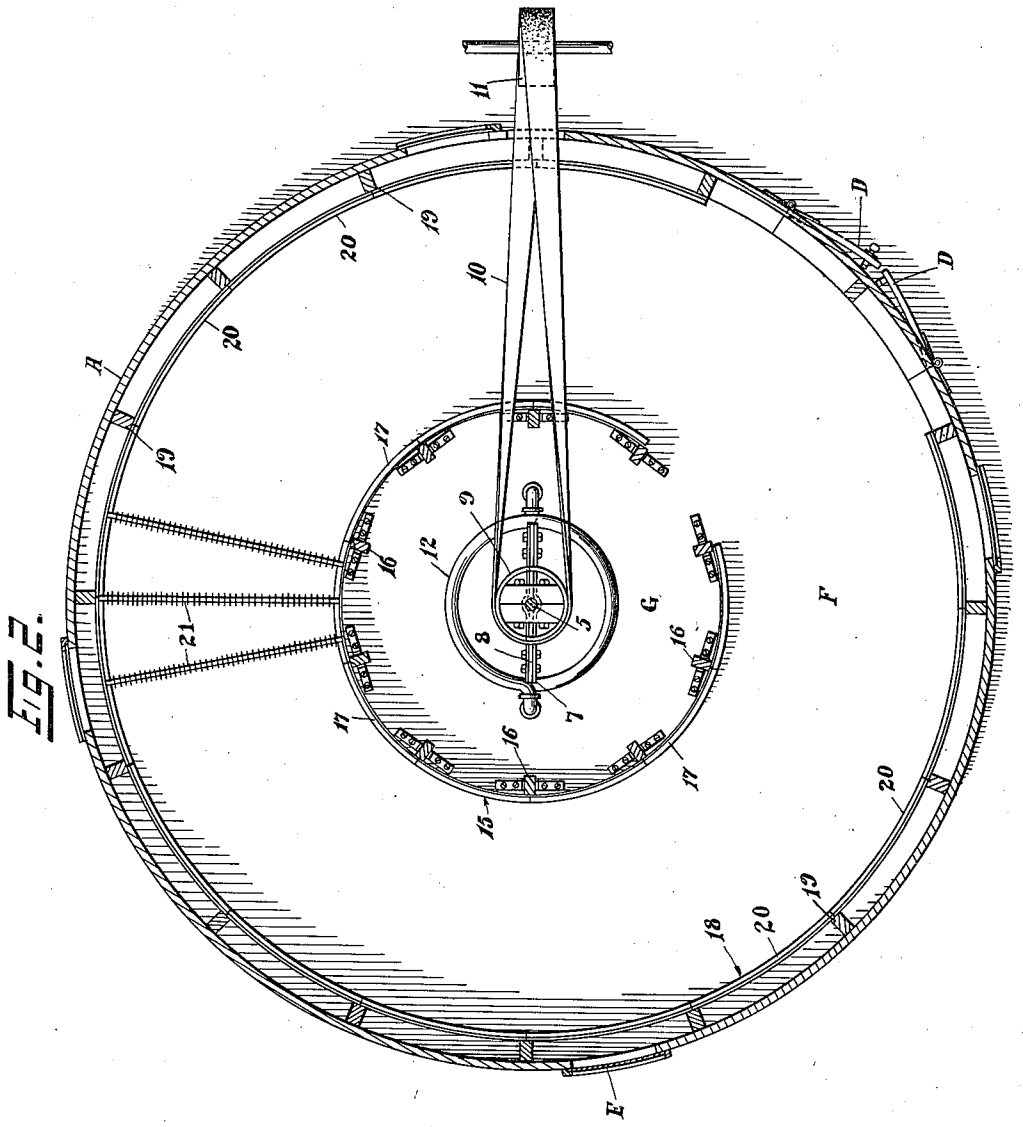



Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## MACARONI-DRYING APPARATUS.

1,217,439. Specification of Letters Patent. Patented Feb. 27, 1917.

Application filed May 13, 1916. Serial No. 97,239.

*To all whom it may concern:*

Be it known that I, ALEXANDER GALLERANI, a subject of the King of Italy, residing in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Macaroni-Drying Apparatus, of which the following is a specification.

This invention relates to an apparatus for drying edible pastes, such as macaroni and the like.

Under the known methods and with the apparatus generally in use, it requires from five to ten days average to properly dry macaroni and the like in the process of manufacture. Furthermore, when so dried, it is very difficult, if possible at all, entirely to subtract all of the moisture from such products, and impossible to entirely subtract all acid gases and the like from the same.

The present invention contemplates the provision of an equipment whereby the macaroni can be dried to extreme hardness in approximately three days, which is practically cutting in half the length of time required to dry a quantity of macaroni with the known apparatus.

The invention further contemplates the provision of means whereby the humidity and acidity can, with facility, be entirely subtracted from the macaroni.

The invention still further contemplates certain improved features of construction particularly adapted for macaroni drying apparatus.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of one specific embodiment thereof illustrated in the accompanying drawings, in which—

Figure 1 is an axial section showing the inside of a room equipped and arranged according to the present invention.

Fig. 2 is a top-plan view of my said apparatus with the top or cover removed so as to show the interior mechanism.

Fig. 3 is a perspective view of a rod for supporting macaroni.

In the embodiment illustrated, a cylindrical housing member A is shown properly supported by and secured to a floor member B and provided with a roof member C covering the chamber or room formed by the housing member A. For affording access to the inclosed chamber, a doorway is provided equipped with doors D, and for facilitating the ventilation of the chamber, openings are provided in the housing A along the floor B and along the roof C, which openings are suitably equipped with the removable closures E.

Centrally of the floor member B there is provided a suitable bearing 4, to receive the lower end of a shaft 5, the upper end of which is suitably mounted in a bearing 6 secured to the roof or cover C and in alinement with the bearing 4. The shaft 5 is provided with transversely extending arms 7 which support the fan wings 8, which extend substantially from the roof to the floor member. For driving the shaft and thereby actuating the fan wings 8, the shaft 5 is provided with a pulley 9 suitably fixed thereon, which is connected by a belt 10 with a suitable drive pulley 11 driven from any suitable source of power.

For coöperating with the fan wings 8 to properly heat the chamber, a coil 12 of steam pipe is disposed around the lower end of the shaft 5, being suitably connected to an inlet pipe 13 and an outlet pipe 14.

For properly supporting the macaroni or other articles to be dried, an inner frame 15 is provided comprising a plurality of vertical standards 16 disposed substantially in a circle concentric with the shaft 5, to which are secured a plurality of horizontally disposed angle iron sections 17 forming with one another a plurality of circular rims, open at one side, the openings of the rims being determined by two adjacent vertical standards 16 and in alinement with one another by means of which access may be had to the fan wings and heating coil from the circular zone F surrounding the inner zone G, in which the heating coil and fan wings 8 are located. The rims formed by the angle iron sections are suitably spaced from one another for purposes hereinafter to appear.

Disposed along the housing member A is provided an outer frame 18 comprising a plurality of vertical standards 19 disposed substantially in a circle permitting free access to the doorway, to which standards 19 a plurality of horizontally disposed iron

angle sections 20 are secured, the angle iron sections forming with one another a plurality of circular rims, open at one side, the openings being determined by two adjacent vertical standards 19, one on each side of the doorway. The alined interruptions in the frame 15 are disposed adjacent to the doorway.

The rims of angle iron sections 20 are preferably equal in number to the rims of angle iron sections on the frame 15 and in alinement with one another to form parallel supports spaced equidistances respectively from the floor member B.

For supporting the macaroni, rods or sticks 21, such as illustrated in Fig. 3, are extended from a rim of the inner frame 15 to a rim at the same level of the outer frame 18, and supported on such rims. The rods or strips of the material or macaroni are suspended from such rods as illustrated in Fig. 1.

As is apparent, the rods may be disposed throughout the entire zone F and transversely thereof with the exception of the portion between the interruption in the frame 15 and the doorway of the housing A, whereby a free passage will be afforded to the inner zone G from the doorway.

By surrounding the lower end of the shaft 5 with the steam coil 12, upon steam passing therethrough the heat radiated thereby will heat the surrounding air which will rise and then upon the actuation of the fan wings 8 such heated air will be distributed throughout and between the suspended macaroni, thereby quickly absorbing the moisture emitted by the macaroni, and the acidity accompanying the same, such rapid absorption of moisture facilitating the subtraction of the acidity. Acidity is permitted to combine with the components of the macaroni when the drying process is slow, and thus by hastening the drying process the action of the acid on the macaroni is substantially prevented.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention.

I claim:

1. An apparatus for drying macaroni or the like, comprising a cylindrical housing, an inner supporting frame, an outer supporting frame concentric with said inner frame, the inner supporting frame inclosing an inner zone while the two frames together define an outer zone, the frames forming means for supporting macaroni or the like, heating means disposed at the bottom of the inner zone, and distributing means disposed in said inner zone for distributing and circulating the air heated by said heating means throughout and between the macaroni supported on said frames.

2. An apparatus for drying macaroni or the like, comprising a housing, an inner supporting frame, an outer supporting frame concentric to said inner frame, the inner supporting frame inclosing an inner zone while the two frames together define an outer zone, rods for supporting macaroni, the frames forming means for supporting the macaroni carrying rods across the outer zone, there being a doorway in said housing and there being interruptions in the said supporting frames in alinement with one another and the doorway to permit a free passage to the inner zone from the said doorway.

3. An apparatus for drying macaroni or the like, comprising a housing, an inner supporting frame, an outer supporting frame concentric to said inner frame, the inner supporting frame inclosing an inner zone while the two frames together define an outer zone, rods for supporting macaroni, the frames forming means for supporting the macaroni carrying rods across the outer zone, a vertical shaft disposed in said inner zone, and fan wings mounted on the same and extending substantially the full height of said housing to facilitate producing the greatest circulation possible.

4. An apparatus for drying macaroni or the like, comprising a housing, an inner supporting frame, an outer supporting frame concentric to said inner frame, the inner supporting frame inclosing an inner zone while the two frames together define an outer zone, rods for supporting macaroni, the frames forming means for supporting the macaroni carrying rods across the outer zone, a vertical shaft disposed in said inner zone, fan wings mounted on the same and extending substantially the full height of said housing to facilitate producing the greatest circulation possible, and heating means surrounding the lower end of said shaft whereby as the surrounding air is heated and rises, the fan wings will receive the same and distribute and circulate the same throughout and between the macaroni.

5. An apparatus for drying macaroni or the like, comprising a housing, an inner open supporting frame, an outer supporting frame concentric to said inner frame, the inner supporting frame inclosing an inner zone while the two frames together define an outer zone, the frames forming means for supporting macaroni or the like, heating means in said inner zone, and distributing means disposed in said inner zone for distributing and circulating the air heated by said heating means through the open inner frame into contact with and between the macaroni supported on said frames.

6. An apparatus for drying macaroni or the like, comprising a housing, an inner

supporting frame, an outer supporting frame concentric to said inner frame, the inner supporting frame inclosing an inner zone while the two frames together define an outer zone, rods for supporting macaroni, the frames forming means for supporting the macaroni carrying rods across the outer zone, a vertical shaft disposed in said inner zone, fan wings mounted on the same and extending substantially the full height of said housing to facilitate producing the greatest circulation possible, a coil of steam pipe surrounding said shaft for heating the air surrounding the same, and fan wings receiving the heated air and distributing and circulating the same throughout and between the macaroni.

7. An apparatus for drying macaroni or the like, comprising a housing, an inner supporting frame, an outer supporting frame concentric to said inner frame, the inner supporting frame inclosing an inner zone while the two frames together define an outer zone, rods for supporting macaroni, the frames forming means for supporting the macaroni carrying rods across the outer zone, there being a doorway in said housing and there being interruptions in the said supporting frames in alinement with one another and the doorway to permit the free passage to the inner zone from the said doorway, and there being windows along the upper and lower ends of said housing for the purpose of ventilation.

8. An apparatus for drying macaroni or the like, comprising a housing, an inner series of vertical standards disposed in a circle in said housing, a plurality of sections of angle irons horizontally disposed on and secured to said standards to form a plurality of rims at different levels, an outer series of vertical standards disposed in a circle in said housing concentric to said inner series of standards, a plurality of sections of angle irons horizontally disposed on and secured to said outer series of standards to form a plurality of rims at different levels in alinement with the rims on the inner series of standards, the inner series of standards inclosing an inner zone while the two series of standards together define an outer zone, and rods for supporting macaroni, the rims forming means for supporting macaroni carrying rods across the outer zone at different levels according to the levels of the respective rims.

9. An apparatus for drying macaroni or the like, comprising a housing, an inner series of vertical standards disposed in a circle in said housing, a plurality of sections of angle irons horizontally disposed on and secured to said standards to form a plurality of rims at different levels, an outer series of vertical standards disposed in a circle in said housing concentric to said inner series of standards, a plurality of sections of angle irons horizontally disposed on and secured to said outer series of standards to form a plurality of rims at different levels in alinement with the rims on the inner series of standards, the inner series of standards inclosing an inner zone while the two series of standards together define an outer zone, rods for supporting macaroni, the rims forming means for supporting macaroni carrying rods across the outer zone at different levels according to the levels of the respective rims, there being a doorway in said housing, and there being interruptions in said plurality of rims of both the inner and outer standards in alinement with one another and the doorway to permit the free passage to the inner zone from said doorway.

10. An apparatus for drying macaroni or the like, comprising a housing, an inner series of vertical standards disposed in a circle in said housing, a plurality of sections of angle irons horizontally disposed on and secured to said standards to form a plurality of rims at different levels, an outer series of vertical standards disposed in a circle in said housing concentric to said inner series of standards, a plurality of sections of angle irons horizontally disposed on and secured to said outer series of standards to form a plurality of rims at different levels in alinement with the rims on the inner series of standards, the inner series of standards inclosing an inner zone while the two series of standards together define an outer zone, rods for supporting macaroni, the rims forming means for supporting macaroni carrying rods across the outer zone at different levels according to the levels of the respective rims, heating means in said inner zone, and distributing means in said inner zone for distributing and circulating the air heated by said heating means throughout and between the macaroni supported on said rods, there being a doorway in said housing, and there being interruptions in said plurality of rims of both the inner and outer standards in alinement with one another and the doorway to permit free passage to the inner zone from said doorway.

11. An apparatus for drying macaroni or the like, comprising a housing, an inner supporting frame, an outer supporting frame concentric to said inner frame, the inner supporting frame inclosing an inner zone while the two frames together define an outer zone, rods for supporting macaroni, the frames forming means for supporting the macaroni carrying rods across the outer zone, a vertical shaft disposed in said inner zone, fan wings mounted on the same and extending substantially the full height of said housing to facilitate producing the greatest cir-

culation possible, a coil of steam pipe surrounding said shaft for heating the air surrounding the same, and fan wings receiving the heated air and distributing and circulating the same throughout and between the macaroni, the heat from the steam pipe coöperating with the fan wings to quickly subtract the humidity and acidity from the macaroni and thereby prevent the acid combining with the macaroni.

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