M. E. DUNKLEY.

PEELING PROCESS FOR FRUIT OR VEGETABLES.

APPLICATION FILED AUG. 23, 1911. RENEWED JAN. 15, 1917.

1,236,690.

Patented Aug. 14, 1917.

2 SHEETS—SHEET 1.

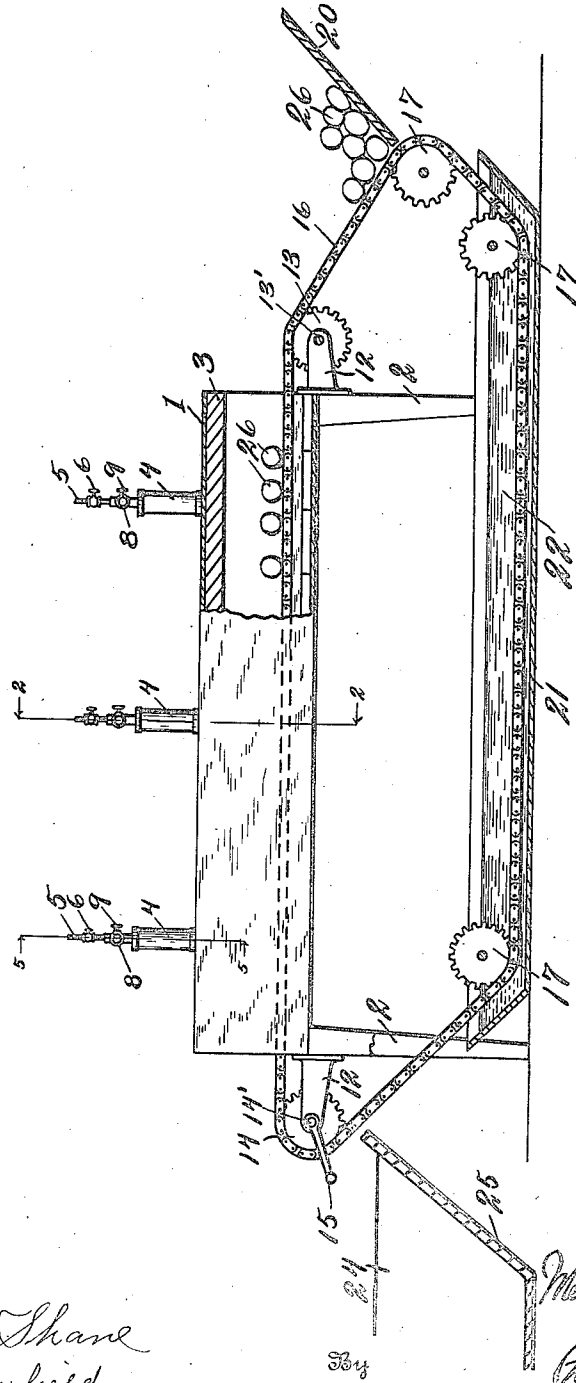


Fig. 1.

Witnesses

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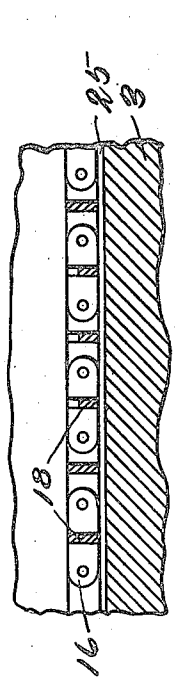


Fig. III.

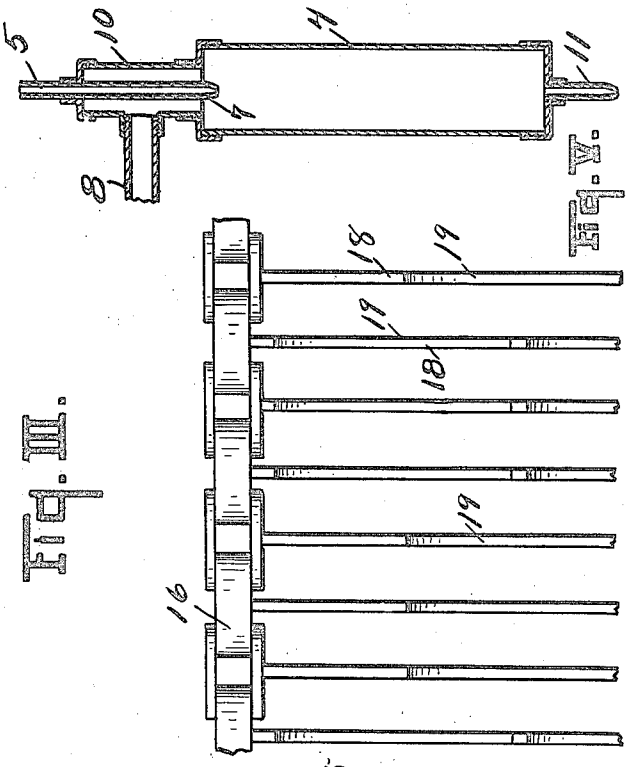


Fig. V.

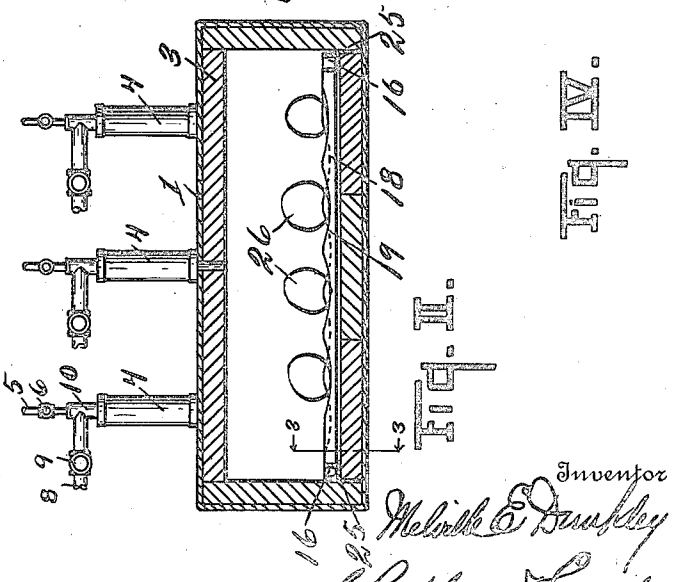


Fig. IV.

Fig. II.

Witnesses

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UNITED STATES PATENT OFFICE.

MELVILLE E. DUNKLEY, OF KALAMAZOO, MICHIGAN.

PEELING PROCESS FOR FRUIT OR VEGETABLES.

1,236,690. Specification of Letters Patent. Patented Aug. 14, 1917.

Application filed August 23, 1911, Serial No. 645,545. Renewed January 15, 1917. Serial No. 142,557.

To all whom it may concern:

Be it known that I, MELVILLE E. DUNKLEY, a citizen of the United States, residing at Kalamazoo, Michigan, have invented certain new and useful Improvements in Peeling Processes for Fruit or Vegetables, of which the following is a specification.

This invention relates to a peeling process for fruit or vegetables, and apparatus for such process.

The objects of the invention are,

First, to provide an improved process of removing the peeling from fruit and vegetables.

Second, to provide an improved apparatus for carrying out the said process.

Objects pertaining to details and economies of construction and operation will definitely appear from the description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

An apparatus, largely diagrammatically illustrated, appears in the accompanying drawing, forming a part of this specification, in which:

Figure I is a detail longitudinal view, partially in section, of an apparatus adapted to carry on my improved process.

Fig. II is an enlarged detail transverse sectional view taken on a line corresponding to line 2—2 of Fig. I, showing the gas heated furnace.

Fig. III is an enlarged detail sectional view taken on a line corresponding to line 3—3 of Fig. II, showing details and arrangement of the conveyer.

Fig. IV is an enlarged detail plan view of the link conveyer and its raddles for carrying fruit or vegetables through the furnace.

Fig. V is an enlarged detail sectional view through one of the gas mixers and burners, taken on a line corresponding to line 5—5 of Fig. I.

In the drawings, the sectional views are taken looking in the direction of the little arrows at the ends of the section lines, and similar numerals of reference refer to similar parts throughout the several views.

Referring to the numbered parts of the drawing, the gas heated furnace 1 is open at both ends and is supported by suitable legs 2—2 and is provided with a fire brick lining 3. A number of burners are provided on top. The mixing chamber 4 of each burner thereof is provided with gas through the pipe 5 controlled by cock 6 delivering through the nozzle 7 thereinto. Compressed air is delivered through the pipe 8 controlled by the cock 9, into the annular chamber 10 surrounding the nozzle 7. By this means compressed air delivers past the gas nozzle 7 into the mixing chamber 4, and the mixture which is thus insured is delivered through the burner nozzle 11 downwardly into the top of the furnace. These burners deliver jets of flame into the top of the furnace which impinge directly upon the specimens which are carried through the furnace.

These burners are provided at sufficiently frequent intervals to secure the proper heat. On the furnace illustrated, which is about 60 inches long and 18 inches wide, I find it desirable to dispose five of these burners.

Brackets 12 are provided at each end of the furnace which carry sprocket wheels 13—14 on shaft 13′ and 14′ respectively. A crank 15 is provided on the shaft 14′ for driving the same.

An endless conveyer made up of sprocket chains 16, which pass over the idler pulleys 17—17—17 in addition to the sprocket wheels 13 and 14, is provided, the sprocket chains being connected to suitable raddles 18. The raddles are notched at 19 as indicated, to form pockets for the fruit or vegetables.

A hopper 20 is provided for delivering fruit or vegetables 26 onto the inclined portion of the conveyer, so that it may be readily carried up and into the furnace. A small quantity of fruit or vegetables is placed in this hopper, so that the same will not become clogged and so that it will be delivered into the furnace with the individual specimens considerably separated.

A tank 21 is provided beneath the furnace and contains a quantity of water 22, through which the conveyer is passed to cool the same so that it will not be injuriously affected by the intense heat of the furnace.

A tank 25 is provided at the tail of the machine, filled with a quantity of water 24 for receiving the fruit or vegetables that is discharged from the furnace.

In carrying out my improved process, the heat generated by the blasts from the burners is such that the furnace is heated to an intense white heat, which I assume is about 2500° F., so that the fire bricks within the furnace become white hot and tacky. The conveyer is driven at different rates depending upon the fruit or vegetable which is to be treated. When peaches are to be operated upon, the speed is such that the peaches remain within the intense heat for a period of about 2 seconds. Apples require about 5 seconds of time; pears, a treatment of about 10 seconds, and the time required will vary for the different fruits and vegetables according to the texture of their skins and their condition of ripeness. Certain fruits or vegetables may require a soaking or partial parboiling in order to secure the best results and the most complete disintegration of the peel.

The action of the blasts upon the fruit or vegetables seems to be of a charring or carbonizing nature and the peel is disintegrated leaving a layer of material which seems to be substantially carbon resting loosely upon the pulp of the specimen. I have termed this a carbonizing action in view of the fact that the cellulose of the peel seems to be broken up leaving a loose deposit of carbon on the surface of the specimen. When delivered from the machine, the specimens have the peel in such condition that it can be readily removed by the hand of the operator or the disintegrated peel can be removed by the improved peach peeling machine which is the subject matter of Patent No. 1,104,175 granted to Samuel J. Dunkley, July 21, 1914. The conditions under which this process is carried out are such that the charring or carbonizing of the peel is effected without subjecting the specimens to the intense heat long enough to cook or injure the pulp so that the skin is disintegrated or carbonized without substantially injuring the pulp of the specimen.

I have not applied the process to all the different fruits to which it is adaptable, as it has not been possible for me to obtain the same in proper condition for experimentation. I am confident, however, there is substantially no fruit or vegetable but what will yield readily to this process, and may be peeled by this process or method; that is, the skin will be completely disintegrated so that it can be readily washed away, either by simply immersing the same in water, or by the hand or brush, or by the improved peeling machine referred to in the patent above indicated.

I have secured the best results by the intense white heat I have indicated. However, the temperature could be raised considerably above that without any harmful consequences, the time of exposure of the fruit or vegetable being proportionately shortened, and I believe the heat could be considerably reduced and by exposing the fruit or vegetable a longer time, satisfactory results could be obtained. I believe the temperature that I have indicated is most effective and satisfactory.

In this connection I desire to state that I have shown a conveyer, but this apparatus is so very rapid that it could be very profitably employed by simply impaling the fruit on a rod and holding it within the furnace and immediately immersing it in water thereafter, or otherwise cooling the same. The immersion is not really necessary, particularly when the heating time is short. I find from experimentation that this process is very much more rapid than any peeling process by mechanical means that is now known to the art. However, such a process is comparatively slow when the possibilities of the conveyer that I have illustrated are taken into consideration.

I believe still different methods are easily available for exposing the fruit to this temperature. It is very clear that a great variety of means might be made use of for this purpose. I am aware also that a direct blast of hot gas on the fruit may be made use of if the temperature of the blast be made sufficiently high and sufficiently large to properly envelop the fruit.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The process of treating fruit or vegetables consisting in exposing the surface of the same to a very high temperature of substantially 2500° Fahr. to disintegrate and cinder the skin, and immediately cooling the fruit to avoid undue cooking thereof.

2. The process of preparing fruits and vegetables for peeling, consisting in rapidly passing the specimens thereof through a zone at a temperature of approximately 2500° Fahr. to disintegrate and incinerate the skin thereof and immediately thereafter immersing the same in cool water.

3. The process of peeling fruit or vegetables consisting in causing a current of gas undergoing combustion to impinge upon the surfaces of the specimens thereof to disintegrate the skin, and thereafter removing the disintegrated skin.

4. The process of peeling fruit or vegetables consisting in carbonizing the skins of the specimens thereof, forming layers of carbon loosely resting upon the pulp, without substantially cooking or injuring the pulp, and thereafter removing the carbonized skin.

5. The process of peeling fruit or vegetables consisting in subjecting the surfaces of the specimens thereof to the action of a current of hot gas to char or carbonize the skin and thereafter removing the charred or carbonized skin.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

MELVILLE E. DUNKLEY. [L. S.]

Witnesses:
LUELLA G. GREENFIELD,
CARRIE E. SHANE.