

March 3, 1931.

W. D. THOMPSON

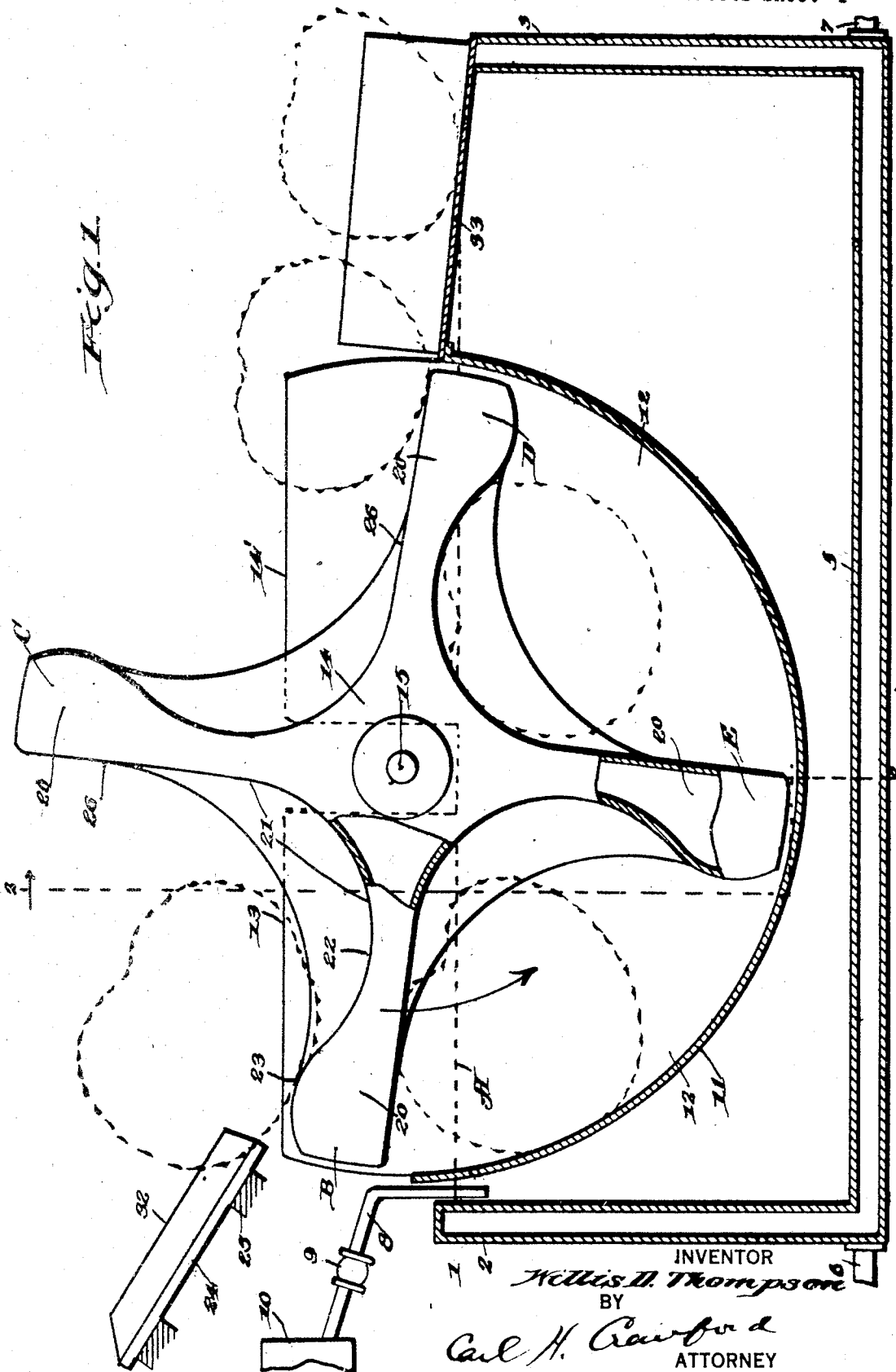
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METHOD OF INCASING EDIBLES

Filed April 4, 1928

3 Sheets-Sheet 1

Fig. 1.



March 3, 1931.

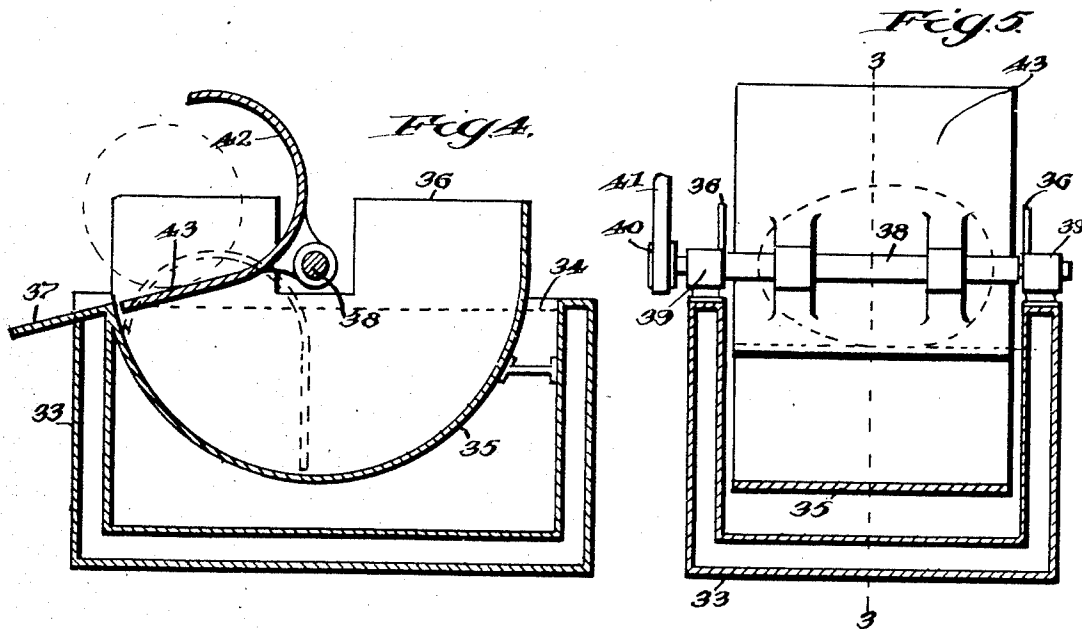
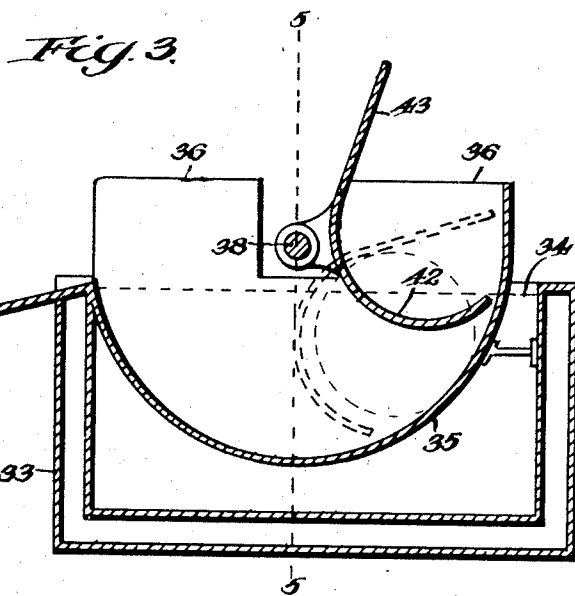
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METHOD OF INCASING EDIBLES

Application filed April 4, 1928. Serial No. 267,368.

The object of this invention is to provide a novel method for incasing edibles. The material preferably employed is that which is broadly disclosed and claimed in my application filed October 30, 1922, Serial No. 597,994.

One of the features of this invention is to provide a novel method for incasing an edible without the necessity of subsequently closing any unsealed part of such casing.

A further feature resides in quickly immersing and withdrawing the edible into and from a relatively hot bath of material of which the casing is formed.

A further feature consists in a novel element which not only functions to immerse the edibles, but which additionally functions to sufficiently agitate the hot bath to prevent the latter from surface scumming or otherwise hardening.

A further object is to localize the area of the hot bath with respect to its agitator in such a manner that substantially all of the bath will be continuously in motion while the edibles being immersed are also prevented from escaping from the means that causes such agitation.

A further feature consists in imparting to the immersed edibles sufficient movement to insure uniform coating of the latter, not only on all of the convex peripheral portions, but also such cavities as for instance the stem and blossom ends of apples.

A further feature consists in a combined immersing and agitating element that is equipped to fully expose the withdrawn and incased fruit to the outer air to facilitate quick hardening or setting of the material.

A further feature consists of an immersing element that is in the form of a rotatable wheel, in combination with means for feeding the entities to be incased into one exposed portion of the wheel and discharging the incased edibles from another exposed portion of the wheel.

The invention will be more fully described in connection with the accompanying drawings and will be more particularly pointed out in and by the appended claims.

In the drawings:

Fig. 1 is a vertical sectional view on line 1—1 of Fig. 2.

Fig. 2 is a vertical cross sectional view on line 2—2 of Fig. 1.

Fig. 3 is a sectional view of a modified form of my invention which is especially designed for coating confections such as ice cream.

Fig. 4 is a similar view with the immersing member in a different position.

Fig. 5 is a sectional view on line 5—5 of Fig. 3.

Like characters of reference designate similar parts throughout the different figures of the drawings.

First describing the specific structure shown, 1 indicates a double walled vat or tank having end walls 2 and 3, side walls 4 and a bottom wall 5. I have shown pipes 6 and 7, connected with said tank and through which hot water or steam or any suitable heating medium may be passed to maintain the contents of the tank 1, at the desired temperature. A pipe 8, suitably controlled by a valve 9, may lead from a suitably heated supply tank 10, for replenishing the bath material as the latter is gradually exhausted by successively casing of edibles, and also to maintain the bath at substantially the level A, so that the level of the bath will constantly be in a given relation to the immersing element, to be presently described.

I have shown means for holding the edibles in relation to the immersing member, and as shown, such means may be in the form of a peripheral guard 11, which is herein shown imperforate although this is not absolutely essential. The arc of this guard 11 is sufficient to extend about all of that peripheral portion of the immersing element that depends into the bath, as will be clearly seen in Fig. 1. I also employ lateral or side guards 12, that are in spaced relation to guard 11, so that perfect freedom for movement of the bath liquid is afforded into, through, and out of the enclosure formed by these guards. The upper margins 13, of said guards 12 extend upwardly along the sides of the immersing element to prevent the fruit from rolling out

of engagement with the latter. Said guards also have upwardly extending margins 14' to guide the incased fruit when the latter is being discharged.

5 Reference will next be made to my improved immersing element.

My improved immersing element is herein shown in the form of a wheel having a hub portion 14, to which or through which a shaft 10 15 may be secured or extended. The end portions of said shaft are shown journaled in bearings 16, suitably mounted on the upper margins of tank 1, as shown in Fig. 2. Said shaft 15 may be extended at 17, and a pulley 15 18 may be mounted thereon whereto power may be applied by a belt 19, to operate the immersing wheel. Said wheel is shown provided with substantially radially disposed blades, which are shown as being equi- 20 distantly spaced apart and four in number, although this is not an essential spacing or a limiting number of blades. These blades or spokes 20, transversely subdivide the wheel into a series of fruit receiving channels which 25 not only open peripherally but also endwise of the wheel, the importance of both these features being hereinafter more fully pointed out. Further, I prefer to make the wheel of aluminum, tin, or some like material of 30 high heat conductivity, so that the wheel will not only quickly be heated to the temperature of the bath, but also, because of the slight time of exposure to the air, will not appreciably lose such heat. I further consider it 35 a feature to make the wheel substantially hollow so that the substantially dead air contained therein will not quickly cool. Hence, it will be seen that the blades 20, instead of being of a single thickness, are actually double 40 walled, and hollow, and liquid tight so that the bath material cannot leak into the wheel.

The fruit receiving channels of the wheels, all of which are preferably alike, each have what I will term a receiving bight formed 45 between two adjacent blades 20. The wheel is to be preferably rotated in a contra-clockwise direction, viewing Fig. 1, and that blade which is in a fruit receiving position, which I will designate at B, has a rear wall which 50 is concave, as indicated at 22, and which merges into the bight 21. The outer end of said wall is convex, as shown at 23, in order to form the concave receiving portion 22, and over which the fruit may be rolled by gravity 55 into said receiving portion 22. I have very generally shown a slide or conveyor 24, suitably mounted at 25, and down along which fruit may roll over the hump 23, and into the receiving portion 22, as will be clearly seen 60 in Fig. 1. Of course, fruit will be delivered to the conveyor 24, in timed relation to the rotation of the immersing wheel. As blade B, descends, the hump 23, will act to hold the fruit in place until blade B has reached the 65 left-hand portion of guard 11. It will be seen

that the adjacent wall of the next blade C, is a flat gravity delivery wall, which I will indicate at 26. I may state that the immersing wheel may be built so that each fruit receiving channel will be of a width to receive 70 only a single fruit entity, in which event, the guards 13, would coact with the wheel to prevent the fruit from rolling endwise out of the fruit receiving channel before descent of the fruit. However, in order to illustrate how 75 the capacity of the device can be greatly increased, and without in any way desiring to limit myself, I have shown the channels provided with subdividing walls 27 so that a row of two entities may be delivered thereto from 80 conveyor 24. I have shown said walls 27 so spaced that different sized fruit may be received in the resulting spaces. For instance, viewing Fig. 2, small size fruit may be received in space 28 and large sizes in space 29. 85 As regards the spacing of the blades from each other, the channels formed thereby may, and in practice have been so spaced that they will receive such a variant of sizes, in the absence of walls 27, that I could incase grape 90 fruit or lemons with equal facility. With the walls 27, this range would be cut down as will be obvious. However, it will be noted that from the bight 21 to the outer ends of the blades, the latter diverge, and in reality, 95 this is the structural feature that affords me the greatest possible range for different sized fruit. Where walls 27 are used in the channels, like means, as indicated at 32, will be used on the conveyor, in the same relation 100 and spacing, whatever the same may be.

Before entering into a minute description of the method and operation of the device, I will next refer to a novel means whereby 105 the fruit may be delivered or discharged from the immersing wheel.

I have shown a gravity delivery wall 33, on tank 1, which is in receiving relation with a gravity wall 26, of blade D, when the wheel is in the position shown in Fig. 1. Thus, it 110 will be seen that the wheel can be loaded and unloaded from different points, and, in the present construction, said points are different peripheral points. The fruit from wall 33, may be received in any desired manner, 115 not herein shown.

I have shown a fruit entity or entities about to be delivered onto blade B. At this point, it may be informative to state that I have in actual practice, with a single entity 120 machine of four pockets as shown, successfully rotated the immersing wheel at fifty revolutions per minute, at which rate, I have incased two hundred apples per minute. Therefore, it will be seen that at such a speed, 125 I have no difficulty in loading and discharging while the wheel is operating at a constant speed, and without the necessity of stopping the wheel for either loading or unloading. With a machine taking more than one entity, 130

the rate of operation would be correspondingly increased.

Continuing the description of operation, it will be clear that the fruit entity between blades B and E, striving to respond to buoyancy, takes the position shown in dotted lines and will bear against guard 11, as well as against wall 26, of blade B. As blade B descends further, the entity will, in responding to buoyancy, seek the highest abutment which will be the bight 21, between blades B and E, for the reason that the outer end of blade B will continue to descend and project below the level A, as rotation continues. Now it will be seen that the fruit entity, regardless of its size, is floatingly immersed and advanced by the blades, and is free to take different positions in its travel through the bath. Hence, I am assured that the bath material will not only completely coat, but also will enter such cavities as the blossom and stem ends of such fruit as apples, for instance, and that the air that might otherwise be pocketed in such cavities is bound to be released. As the wheel advances, it will be seen that the entity between blades E and D, will seek the highest point, which is the bight 21, and then as blade E advances from the position shown, and blade D ascends out of the bath, the straight wall 26 of blade E, will shift the fruit entity toward the guard 11, as blade E ascends. Thus, when blade E, reaches the point now occupied by blade D, the entity on top of wall 26, will be at nearly the radially outer end thereof and in position quickly to roll onto wall 33. In fact, just as soon as blade D, gets to the position shown, or as soon as it gets far enough so that the guard 11 will release the entity, the latter will, by gravity, seek a radially outermost position on wall 26 and after such entity has ascended above guard 11, so as not to be restrained thereby, it will freely roll toward and onto wall 33, in spite of the fact that wall 26 is ascending. Now it will be clear that just as soon as the entity emerges from the bath, it will be almost entirely exposed to the surrounding air, and at this point, the importance of having the fruit receiving channels open both peripherally and endwise of the wheel, will be clear, since this construction greatly facilitates the fullest exposure of the incased entity to the outer air. It will also be clear that the upstanding guards 14', will prevent the entity from rolling off the wheel, laterally thereof.

It is desired to explain that as the wheel blades ascend out of the bath, the latter drains off from the projecting portions of the wheel, cleanly, and much after the fashion of water, although in fact, the bath material is slightly thicker and less fluid than water. It is also noted from actual practice that the wheel blades, from the delivery to the intake position, do not appreciably cool off from the bath

temperature. This is partly due to the slight period of exposure to the outer air, and partly due to the fact that the blades are hollow and filled with dead air that is maintained at substantially bath temperature. If the wheel was of a skeleton form, the blades would lose much of their temperature in passing from the delivery to the intake position.

By reason of the relatively low temperature of the fruit compared to the bath, the shell begins to set just as soon as the fruit enters the bath, and by the time it is lifted out of the bath, the inner portions of the shell have set, leaving only a thin portion outside, to be set by the outer air. Hence, I am assured of a casing completely covering the fruit and uniformly setting, just as soon as the fruit has been raised to the delivery position in relation to wall 33. Further, the fruit is really never in a single position while in contact with any blade, and this prevents abutting contact from having any tendency to prevent a complete coating of the fruit.

I will next explain the particular nature of the bath material for which this device was particularly designed to operate.

In my application filed October 30, 1922, Serial No. 597,994, I have disclosed a bath material adapted to incase either frozen or refrigerated edibles, and this bath material is composed, in one embodiment, of asphalt and paraffin, and in another embodiment, of asphalt, paraffin, and stearin.

The paraffin is the body ingredient, the asphalt is the binder and thickener, and the stearin is the hardener. The preferred minimum and maximum melting point paraffin which I have found practical, is that having a low melting point of 118° F. and a high melting point of 130° F. As regards asphalt, the low melting point may be 110° F. and the high melting point 120° F., with a penetration of 80 to 90. As regards stearine, (vegetable base rather than cococine base) the low melting point may be 140° F. and the high melting point 150° F. The most practical proportions of the three ingredients, on a hundred pound mix, is:—paraffin, 80 lbs.; asphalt, 12½ lbs.; and stearine, 7½ lbs.

In practice, I prefer to keep the resulting bath at about one hundred and twenty five degrees F., although with different melting point materials higher or lower bath temperatures are practically possible and I would say that a minimum bath temperature would be substantially 120° F. and a maximum bath temperature 130° F.

This bath is a quick cooling bath material. In practice, I have found that I cannot get instant cooling of the material without having the fruit refrigerated to some extent. However, I use the term "refrigerated" broadly, and have gotten good results where the fruit was at as high a temperature as fifty degrees F., but better results, that is, quicker

setting of the casings can be obtained if the fruit is between 35 and 40 degrees F. The main reason why the fruit should be at a temperature in sharp contrast with the bath, which is broadly a refrigerated fruit, is that with such a low temperature, the casing is "set" not only by the outer air, but also by the inner cooling action of the fruit. This is important by reason of the fact that the material is a low conductor of heat, which is a highly valuable property. In this respect, I have found that best results have been obtained in having the dipping operation carried on with the surrounding air not above seventy degrees F. However, better results can be obtained if the surrounding air is between fifty and sixty degrees F. This surrounding temperature is important, as according to the best of my knowledge, the quick setting of the casing is the result of the joint action of the cool fruit, on the inside of the shell and the cool air on the outside of the shell.

As a guide to the public, in carrying out this method, it may be stated that if, for instance, the bath cools to an extreme below its practical minimum temperature, then the coating on the fruit would be far too thick, or if the time of immersion was prolonged, the shell would be far too thick, and further, with a normal bath temperature and with the fruit say, at thirty one degrees F., a too thick coating would result. In practice, I have found that a shell approximately the thickness of a hen's egg is the best, especially for hard fruit like pears and apples, for instance. For softer fruit like grape fruit or oranges, it may be desirable to form a slightly thicker shell.

If the temperature of the bath was over the practical maximum, the shell would be too thin, irrespective of the period of immersion, and if the period of immersion was too rapid, the shell would be either too thin or would incompletely cover the fruit.

The best results are obtained if the period of immersion is not over two seconds and it may be as low as a second and a fraction.

I have successfully used asphalt and paraffin, in combination, without a hardener, and have succeeded in forming a complete shell about fruit in the same manner and with equal facility with respect to the combination of ingredients above set forth, that is, including a hardener, such as stearin. However, in the absence of a hardener, the shell cannot be removed from the fruit nearly so easily as with a hardener. Thus, while I prefer to employ the hardener, for the more advantageous results of quick removal of the shell, I do not wish to be limited thereto.

A feature of importance is that the tank should not be made so large but that the wheel will keep the entire contents of the tank agitated, thereby preventing scumming,

and also acting to maintain a uniform temperature of the bath by reason of the fact that the constant agitation brings central or intermediate portions of the bath material constantly into engagement with the heated walls of the tank. This is important because the constant ingress of cooled or refrigerated fruit, acts to cool the bath, and even if an excess of heat were applied to the bath, still, in the absence of agitation, central portions of the bath would soon become too cool.

It will be noted that with the pockets or fruit receiving channels not only opening peripherally but also laterally, the bath material will drain off from the ascending blades very quickly, and this is desirable not only for the purpose of avoiding cooling off of the bath, but to prevent any tendency of the bath material to harden on the blades in gobs.

As a criterion for my use of the word "refrigerated", it may be stated that I use it in the sense of that temperature which is low enough to retard or prevent bacterial growth.

In Figs. 3, 4 and 5, I have shown a modified form of my invention in which the heated vat is designated at 33, and is adapted to contain the bath material having a level shown at 34. I have shown a peripheral guard at 35, and lateral guards at 36. A gravity delivery board is shown at 37. A shaft 39, is journaled in bearings 39 and may be operated by a pulley and belt 40 and 41, respectively.

This form of the invention has been developed for small edibles and is of especial advantage in coating ice cream in the form disclosed by my hereinbefore identified case. I may say that the bath, for this machine, would follow the temperature and other instructions set forth in said case as regards the lower point melting asphalt and paraffin than should be used on fruit, to economical advantage.

In this form of the invention, the immersing member is shown in the form of a U-shaped receiver having a concave receiving portion 42, and a combined immersing and gravity delivery portion 43. The ball of egg-shaped body of ice cream is advisedly of smaller diameter than the concave receiving portion 42, so that the ice cream body will be free to turn and will merely be floatingly guided through the bath and by reason of its limited but free action under buoyancy, all portions will be coated. The bath material is free to move past the guard 35 and be brought into engagement with the heated walls of the vat, as in the preferred construction.

In Fig. 3, I have shown in dotted lines, one stage of revolution of the immersing member wherein the immersing portion 43 is causing the ice cream body to descend in the bath.

In the dotted line position in Fig. 4, the ice cream body is buoyantly lifted into engagement with the receiving portion 42. In the full line position in Fig. 4, I show how the delivery portion 43 registers with delivery board 37, so that the coated ice cream body can roll off by gravity. The speed of this type of machine, for this particular purpose, will be as rapid as the feed-in means, which may be either manual or otherwise, will permit.

I do not wish to be limited to the disclosure herein made except for such limitations as the claims may import.

I claim:

1. The herein-described method of incasing edibles, which consists, in floatingly immersing the edible into and through a hot bath of quick hardening incasing material with the edible freely moving responsive to buoyant action to thereby expose all peripheral portions of the edible to said bath, and in withdrawing the coated edible from the bath.

2. The herein-described method of incasing fruit entities, which consists, in floatingly immersing a cold or cooled fruit entity into and through a hot bath of quick hardening material with the entity freely moving responsive to buoyant action to thereby expose all peripheral portions of the entity to said bath, and in withdrawing the incased entity from the bath and exposing the entity to a cooling atmosphere to hasten setting of the material.

3. The herein-described method of incasing fruit entities, which consists, in floatingly moving a fruit entity of a temperature at approximately forty degrees F., in a liquid bath of quick hardening material having approximately a temperature of 120 to 130 degrees F., and removing the coated entity into a surrounding air temperature of not over seventy degrees F., and preferably under such temperature.

4. The herein-described method of incasing edibles, which consists, in floatingly immersing a buoyant edible into and through a heated bath of quick hardening material to coat the edible, in restricting the volume of the bath material sufficiently to cause agitation of the latter by passage of the edible therethrough and thereby prevent scumming and maintaining the material substantially uniform in temperature in all portions of the bath, and in withdrawing the coated edible from the bath.

5. The herein-described method of incasing edibles, which consists, in floatingly immersing a buoyant edible into and through a hot bath of quick hardening incasing material with the edible freely movable responsive to its buoyancy to thereby expose all peripheral portions of the edible to said bath, the bath being sufficiently restricted in vol-

ume to be agitated by movement of the edible therethrough to prevent scumming and maintain all portions of the bath at substantially uniform temperature, and in withdrawing the incased entity from the bath and exposing the entity to a cooling atmosphere to hasten setting of the material.

In witness whereof, I have hereunto affixed my signature.

WILLIS D. THOMPSON.

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