

Statements of Invention

1. A frozen dessert ingredients molding apparatus for successively hardening parts of sets of frozen dessert ingredients so as to each have a hollow recess shape, the frozen dessert ingredients molding apparatus comprising:

a transporting unit configured to transport a plurality of containers;

a filling unit configured to fill the containers with the sets of frozen dessert ingredients;

a molding unit configured to sequentially immerse and pull a cooled protruding mold into and out of the sets of frozen dessert ingredients being transported so as to harden at least part of each of the sets of frozen dessert ingredients around the mold; and

a refrigerant feeding unit configured to feed a refrigerant to the mold, wherein

the mold is configured to be cooled to a predetermined temperature during a period from completion of hardening of a first set of frozen dessert ingredients to start of hardening of a second set of frozen dessert ingredients being successively transported while conducting a predetermined number of hardening processes within a predetermined amount of time.

2. The frozen dessert ingredients molding apparatus according to statement 1, wherein

the predetermined temperature is a temperature sufficient for hardening the at least part of each of the sets of the frozen dessert ingredients around the mold.

3. The frozen dessert ingredients molding apparatus

5 according to statement 1 or 2, wherein

the molding unit immerses the mold having been pulled out of the first set of frozen dessert ingredients into the second set of frozen dessert ingredients after a surface temperature of the mold is lowered at least to a boiling point of liquid oxygen.

4. The frozen dessert ingredients molding apparatus

according to any one of statements 1 to 3, wherein

the mold is formed by a metal having a plate thickness smaller than 1 mm.

15 5. The frozen dessert ingredients molding apparatus

according to any one of statements 1 to 4, wherein

the molding unit inserts the mold into each of the sets of frozen dessert ingredients more than once.

6. The frozen dessert ingredients molding apparatus

20 according to any one of statements 1 to 4, wherein

the molding unit includes a plurality of molds, and

the molding unit moves the plurality of molds down and up so as to immerse the molds into the sets of frozen dessert ingredients.

25 7. The frozen dessert ingredients molding apparatus

according to any one of statements 1 to 6, comprising an injection unit configured to inject a refrigerant into a recess hardened by the mold.

8. The frozen dessert ingredients molding apparatus

according to any one of statements 1 to 7, wherein

the molding unit conducts about 80 to 240 hardening processes per minute.

9. A frozen dessert ingredients molding method for successively hardening parts of sets of frozen dessert

ingredients so as to each have a hollow recess shape, the frozen dessert ingredients molding method comprising the steps of:

transporting a plurality of containers;

filling the containers with the sets of frozen dessert ingredients;

sequentially immersing and pulling a cooled protruding mold into and out of the sets of frozen dessert ingredients being transported so as to harden at least part of each of the sets of frozen dessert ingredients around the mold; and

feeding a refrigerant to the mold, wherein

the mold is cooled to a predetermined temperature during a period from completion of hardening of a first set of frozen dessert ingredients to start of hardening of a second set of frozen dessert ingredients being successively transported

while conducting a predetermined number of hardening processes

within a predetermined amount of time.

10. The frozen dessert ingredients molding method according to statement 9, wherein

the predetermined temperature is a temperature sufficient
5 for hardening the at least part of each of the sets of the frozen dessert ingredients around the mold.

11. The frozen dessert ingredients molding method according to statement 9 or 10, comprising pulling the mold out of the first set of frozen dessert ingredients and immersing the mold
10 into the second set of frozen dessert ingredients after a surface temperature of the mold is lowered at least to a boiling point of liquid oxygen.

12. The frozen dessert ingredients molding method according to any one of statements 9 to 11, wherein

15 the mold is formed by a metal having a plate thickness smaller than 1 mm.

13. The frozen dessert ingredients molding method according to any one of statements 9 to 12, comprising moving a plurality of the molds down and up in synchronization with
20 each other so as to immerse the molds into the sets of frozen dessert ingredients.

14. The frozen dessert ingredients molding method according to any one of statements 9 to 13, comprising inserting the mold into each of the sets of frozen dessert ingredients more
25 than once.

15. The frozen dessert ingredients molding method according to any one of statements 9 to 14, comprising injecting a refrigerant into a recess hardened by the mold.

16. The frozen dessert ingredients molding method according to any one of statements 9 to 15, comprising conducting about 80 to 240 hardening processes per minute by the mold.

CLAIMS

1. A frozen dessert ingredients molding apparatus for successively hardening parts of sets of frozen dessert ingredients so as to each have a hollow recess shape, the frozen dessert ingredients molding apparatus comprising:

a transporting unit configured to transport a plurality of containers;

a filling unit configured to fill the containers with the sets of frozen dessert ingredients;

a molding unit configured to sequentially immerse and pull a cooled protruding mold into and out of the sets of frozen dessert ingredients being transported so as to harden at least part of each of the sets of frozen dessert ingredients around the mold; and

a refrigerant feeding unit configured to feed a refrigerant to the mold, wherein

the mold is configured such that the mold waits until liquid oxygen is attached to an outer surface of the mold after the mold has been pulled out of one of the sets of frozen dessert ingredients, and then is immersed into another one of the sets of frozen desert ingredients.

2. The frozen dessert ingredients molding apparatus according to claim 1, wherein

the mold is immersed into the another one of the sets of frozen dessert ingredients in a state in which liquid oxygen is attached to the outer surface of the mold.

5 3. The frozen dessert ingredients molding apparatus according to claim 1 or 2, wherein

the refrigerant feeding unit feeds the refrigerant into a hollow portion of the mold.

10 4. A frozen dessert ingredients molding method for successively hardening parts of sets of frozen dessert ingredients so as to each have a hollow recess shape, the frozen dessert ingredients molding method comprising the steps of:

15 transporting a plurality of containers;

filling the containers with the sets of frozen dessert ingredients;

sequentially immersing and pulling a cooled protruding mold into and out of the sets of frozen dessert ingredients
20 being transported so as to harden at least part of each of the sets of frozen dessert ingredients around the mold; and

feeding a refrigerant to the mold, wherein

the mold waits until liquid oxygen is attached to an outer surface of the mold after the mold has been pulled out
25 of one of the sets of frozen dessert ingredients, and then is

immersed into another one of the sets of frozen desert ingredients.

5. The frozen dessert ingredients molding method according
5 to claim 4, wherein

the mold is immersed into the another one of the sets of frozen desert ingredients in a state in which liquid oxygen is attached to the outer surface of the mold.

10 6. The frozen dessert ingredients molding method according to claim 4 or 5, wherein

the refrigerant is fed into a hollow portion of the mold.