

NOODLE CRUSHING AND DISPENSING SYSTEM

TECHNICAL FIELD

5 This invention relates to a system for breaking up dried noodles. In particular, the invention relates to a system that provides a user with a rapid and efficient way to dispense dried noodles that have been broken up, to the degree preferred by the user, into a cup before seasonings and hot water are added to produce a portion of noodle soup. The breaking up may encompass cutting, crunching, crushing or a combination
10 thereof.

BACKGROUND

 The demand for noodle meals prepared from dried noodles typically with
15 seasoning ingredients in powder form and hot water added to rehydrate the dried noodles is extremely high in many parts of the world, especially in Asian countries. So-called instant noodles are usually purchased packaged with a separate sachet containing a flavour ingredient mix in powder form. The noodles are typically present as a cake of dried noodles which is broken up into a cup or bowl, whereupon the flavour mix is
20 sprinkled on the noodles, and hot water is added to transform the combination into a flavoursome hot noodles meal. A principal advantage of instant noodles is that they are quick to prepare and are therefore suitable for lunch breaks or any other occasion where food is desired and there is little time.

 One disadvantage of instant noodles is the perception many consumers have that
25 they are processed and preserved food. In other words, instant noodles do not have the fresh and natural attributes that consumers are seeking more and more in their food choices.

 Another disadvantage relates to the packaging used for instant noodles. In particular, the sachet used to hold and protect the dried noodle cake is often heavily
30 structured packaging material. Thus, the use of such materials is not considered environmentally friendly. Further, each type of flavouring for instant noodles needs its own graphic design and package labelling. Thus, since there are many different flavouring possibilities, many different types of printed packaging are needed and retailers need to store a variety of packages so as to allow customers to choose their
35 desired flavour.

With the continued demand by consumers for ready-to-go fast foods, the consumer has many choices available, but some meal types are not as readily available as others especially if they require processing or handling steps. In the case of noodles, the consumer may be able to purchase a hot cup of prepared noodles from a dispensing machine, but will be limited by the flavours available. Also, consumer preference for noodle size varies. Some prefer to eat relatively long noodles, which may for example be easier to eat with chop sticks or a fork, whereas others prefer to eat smaller noodles, which may for example be easier to eat with a spoon. Generally, the consumer must accept the size of noodles provided in a cup of prepared noodles obtained from a dispensing machine, or must purchase a pack of instant noodles and then have the hassle of breaking up the noodle cake by hand to obtain the preferred noodle size.

Cup noodles dispensing machines are known and are widely used throughout some Asian countries. Japanese patent application no. 06-248365 describes one device for automatically dispensing a noodle soup where a soup and hot water are delivered to noodles in a cup which is located in a take-out port. However, the consumer has no choice as to the size of the noodles in the soup and has little interaction with the device.

There is therefore an on-going need to find ways to provide consumers with easily and rapidly obtainable noodle meals that deliver their preferred flavourings and noodle size.

It is an object of the present invention to overcome or ameliorate at least one of the disadvantages of the prior art, or to provide a useful alternative.

An object of a preferred embodiment of the present invention is therefore to provide a system for breaking up, such as cutting and/or crushing and dispensing dried noodles that at least goes part way to overcoming one or more of the above disadvantages, or at least provides a useful alternative.

Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or forms part of common general knowledge in the field.

Unless the context clearly requires otherwise, throughout the description and the claims, the words "comprise", "comprising", and the like are to be construed in an inclusive sense as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to".

SUMMARY OF THE INVENTION

According to a first aspect, the invention provides a system for breaking up dried noodle cakes into noodle pieces and dispensing the noodle pieces, the system comprising:

- a magazine for storing a plurality of dried noodle cakes,
- 5 a compartment in communication with the magazine,
- a noodle cake dispensing system for dispensing single dried noodle cakes from the magazine into the compartment in response to input from an operator,
- a breaking up device for breaking up a dried noodle cake located in the compartment into noodle pieces, the dried noodle cake being broken up to a degree
- 10 selected by the operator, wherein the system receives input from the operator in the form of a mechanical input or from an electronic input unit, and
- a receptacle holding station for temporarily holding a receptacle for receiving the noodle pieces.

Described herein is a system for breaking up dried noodle cakes into noodle

15 pieces and dispensing the noodle pieces. The system may comprise a magazine for storing a plurality of dried noodle cakes, a compartment in communication with the magazine, a noodle cake dispensing system for dispensing single dried noodle cakes from the magazine into the compartment in response to input from an operator, a breaking up device for breaking up a dried noodle cakes located in the compartment into noodle

20 pieces, the dried noodle cake being broken up to a degree selected by the operator, and a receptacle holding station for temporarily holding a receptacle so as to receive the noodle pieces. The noodle cake dispensing system successively dispenses individual dried noodle cakes. The breaking up device is arranged in the compartment so as to receive the dried noodle cakes from the noodle cake dispensing system. The magazine

25 stores a number of dried noodle cakes. It is preferred that the magazine has a capacity for storing 20 dried noodle cakes, but the number may vary.

The dried noodle cakes may have a frusto-conical geometry, a parallelepiped-like geometry, a cylindrical geometry or any other suitable geometry. The noodle cake dispensing system receives input from an operator, which may be in the form of a

30 mechanical input, e.g. via a handle or knob, which prompts the noodle cake dispenser to dispense a single dried noodle cake. Alternatively, an electronic input unit, e.g. a keyboard or the like, may convey the input to the noodle cake dispensing system. The breaking up device may crush or cut the dried noodle cake, or the breaking up device may also perform a combination of crushing and cutting. The cutting may also be seen

as highly localised crushing depending on the structure of the dried noodle cake and/or the sharpness of the breaking up device.

The receptacle holding station is configured for receiving a receptacle, e.g. a cup or a bowl, into which the broken up pieces of the dried noodle cake are transferred. The operator, i.e. the customer or a shop assistant or the like, places a suitable receptacle or container in the receptacle holding station. The receptacle holding station may comprise a device for supporting the receptacle during the dispensing of the broken up noodle pieces. The support may e.g. be a pair of arms or simply a platform. After the operator has broken up the dried noodle cake to the desired degree, the operator removes the receptacle from the receptacle holding station and transfers the receptacle to a hot water dispensing station. Seasoning may be added, either manually or in connection with or at the hot water dispensing station.

Preferably, the breaking up device may be configured for crushing the dried noodle cake. By crushing the dried noodle cake it is contemplated that the resulting dried noodle cake pieces or parts are capable of becoming relatively small, which is preferred by some.

Preferably, the breaking up device may comprise two crushing elements arranged for crushing a dried noodle cake by compression. As before, the compression of the dried noodle cakes is contemplated to produce relatively small dried noodle pieces.

Preferably, one of the two crushing elements may be in a fixed position and the other crushing element is movable to crush the dried noodle cake between the two crushing elements. Such an arrangement may reduce the complexity of the device and allow a relatively high pressure to be applied to the dried noodle cake.

Preferably, one or both of the crushing elements may comprise(s) anvil part(s) for enhancing the crushing of the dried noodle cake. The anvil part or parts are contemplated to provide a distribution of the force over a certain area of the dried noodle cake used for crushing the dried noodle cake and thereby enhance the efficiency of the crushing operation.

Preferably, the breaking up device may be configured for cutting the dried noodle cake. By cutting the dried noodle cake, larger pieces may be obtained, which is preferred by some.

Preferably, the breaking up device may comprise a fixed cutting part and a movable pressing part arranged so as to press the dried noodle cake against the cutting part. This is contemplated to be the most efficient way to break up the dried noodle cake. By fixating the cutting part, a lower wear on the cutting part may be obtained. The dried

noodle cake may then rest on the cutting part and the pressing part may then be forced onto the dried noodle cake. The movable pressing part may either be accelerated towards the dried noodle cake, e.g. by use of a spring, or more gently press the dried noodle cake against the cutting part.

5 Preferably, the cutting part may comprise 1, 2, 3, 4 or more knife edges. These knife edges may be arranged in a variety of patterns, including but not limited to a cross, a star, a grid, concentric circles or combinations hereof. The specific pattern will determine the size of the resulting pieces of dried noodle cake.

10 Preferably, the noodle cake dispensing system may comprise a dried noodle cake holder for holding and dispensing an individual single dried noodle cake, and the dried noodle cake holder being arranged for rotating the dried noodle cake so as to dispense the dried noodle cake from the magazine to the compartment. The dried noodle cake holder may act as a gate ensuring that only a single dried noodle cake is dispensed at each operation. Advantageously the dried noodle cake holder holds a single dried noodle
15 cake before the operation of the system is initiated. After the operation of the system is completed, a new dried noodle cake may be transferred to the dried noodle cake holder so that the next operation may be initiated immediately.

20 Preferably, the input from the operator to the noodle cake dispensing system includes operation of a gear. As will be shown later, the gear will allow the operator to pull a handle or knob which, via the gear, causes the dried noodle cake holder to dispense a single dried noodle cake.

BRIEF DESCRIPTION OF THE FIGURES

25 Figures 1(a) to 1(d) are schematic illustrations of magazines for storing dried noodle cakes.

Figure 2(a) is a schematic illustration of steps of operation of a dried noodle cake holder.

Figure 3 is a schematic illustration of a lever for operating a dried noodle cake holder.

30 Figure 4 is an exploded view of a two-part noodle cake break up device, here in the form of a crushing device.

Figure 5(a) is a schematic view of the assembled dried noodle break up device of Figure 4.

Figure 5(b) schematically illustrates steps of operation of a break up device with and without a supplementary cutting device.

Figure 5(c) schematically illustrates a break up device utilising a spring for providing additional force for breaking a dried noodle cake.

Figure 5(d) schematically illustrates a break up device utilising a spring for returning the crushing part to an initial state.

- 5 Figure 5(e) schematically illustrates a break up device having a push-plate for allowing an operator to push to break up a dried noodle cake.

Figure 6(a) schematically illustrates the re-initiation of a trigger device, into its initial state.

Figure 7(a) schematically illustrates constituent parts of one embodiment of a system for breaking up dried noodle cakes.

- 10 Figure 7(b) schematically illustrates constituent parts of another embodiment of a system for breaking up dried noodle cakes.

Figure 8 schematically illustrates cutting parts for a system for breaking up dried noodle cakes.

Figure 9 schematically illustrates three possible geometric shapes of dried noodle cakes.

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DETAILED DESCRIPTION

- The invention relates to a system for breaking up, such as crushing or cutting or a combination thereof, a dried noodle cake 12, 14, 16 and thereafter dispensing dried
20 noodle pieces where the user can select the degree of crushing or comminuting in order to obtain noodles of the preferred size.

- Although the system may be employed in any suitable location, the main use will be in outlets such as automobile fuelling stations, school and workplace canteens, convenience stores, train stations, or anywhere one might find a food or beverage
25 dispensing machine.

- The system allows the retailer to load standardised dried noodle cakes 12, 14, 16 into the system which may then be broken up by the consumer, or other operator, to the customer's desired degree and dispensed into a receptacle, such as a cup or a bowl. This gives a perceived freshness to the delivery of crushed noodles, compared with taking
30 a packaged noodle cake to which a seasoning mix and hot water are added. It is expected that the retailer will be provided with bulk packs of noodle cakes which can then be loaded into the system. The seasoning mixes may be provided by any suitable means, including packed in the sachets that are currently used for standard instant noodle products. This will mean less packaging material is used overall compared to current

instant noodle products. In addition, the consumer interaction with the system introduces a fun factor to preparing noodle meals.

Figures 1(a) to 1(d) are schematic illustrations of magazines 10, 10', 10'', 10''' for storing dried noodle cakes 12, 14, 16.

5 Figure 1(a) is a schematic side view of a magazine 10 or hopper for holding a number of dried noodle cakes 12, 14, 16. In this illustration the dried noodle cakes 12, 14, 16 are in the form of truncated cones, and round cylinders similar to those illustrated in Figure 1(d) and Figure 9, denoted noodle cake B1 and B2 and 12, 14. In Figure 1 the magazine 10 includes a V-shaped section so that the vertical size of the magazine is
10 limited. The dried noodle cakes 12, 14, 16 are advanced through the magazine 10 by gravity.

 The system 20 in Figure 7 is used for breaking up dried noodle cakes 12, 14, 16 and dispensing the broken up dried noodle pieces to a receptacle 22 such as a cup or bowl. The system 20 comprises a magazine 10 or storage device for storing a plurality of
15 dried noodle cakes 12, 14, 16. The preferred size of the magazine 10 holds 10 to 20 dried noodle cakes 12, 14, 16. As illustrated in Figure 9 there are at least three possible geometries of the dried noodle cakes 12, 14, 16. Figure 1(a) and Figure 1(d) illustrate magazines for storing type B1 and B2 noodle cakes 12, 14. Figures 1(b) and 1(c) illustrate magazines for storing type A dried noodle cakes 16.

20 The dried noodle cakes 12, 14, 16 typically have a shelf life in the magazine 10, 10', 10'', 10''' of up to two weeks, but demand from the customers will typically prompt the system owner to refill the magazine before then.

 Figures 1(c) and 1(d) illustrate magazines 10'', 10''' that stack the dried noodle cakes 12, 14, 16 vertically and straight.

25 Figure 2(a) is a schematic illustration of steps of operation of a dried noodle cake holder 24. The dried noodle cake holder 24 is adapted to the geometry of the individual dried noodle cakes 12, 14, 16. The dried noodle cake holder 24 supports the lowest dried noodle cake 12, 14, 16 in the magazine 10, 10', 10'', 10'''. The dried noodle cake holder 24 prevents the dried noodle cakes 12, 14, 16 in the magazine from being unintentionally
30 dispensed further into the system 20.

 The dried noodle cake holder 24 is arranged to be rotated 180 degrees so that the lowest, or next in line, dried noodle cake 12, 14, 16 in the magazine 10, 10', 10'', 10''' is transferred further into the system 20, i.e. to a compartment 26 in communication with the magazine 10, 10', 10'', 10'''. In the compartment 26, the dispensed dried noodle cake
35 will be held in place for breaking up, i.e. crushing, cutting or both. This is discussed further

below. The upper part of Figure 2(a) illustrates front views of the dried noodle cake holder 24. The lower part of Figure 2(a) illustrates side views of the dried noodle cake holder 24. Both upper and lower left side illustrations illustrate the dried noodle cake holder 24 in a waiting or initial state, where the dried noodle cake 12, 14, 16 is ready to be dispensed. Both upper and lower right side illustrations illustrate the dried noodle cake holder 24 in a dispensing state where the held dried noodle cake 12, 14, 16 is transferred from the magazine 10, 10', 10'', 10''' to the compartment 26.

The noodle cake dispensing system is arranged for dispensing a single dried noodle cake from the magazine 10, 10', 10'', 10''' into the compartment 26 in response to input from the operator. This input may be via a handle 28, as illustrated in Figure 3. The user, or operator, pulls the handle or lever 28 so as to activate the dried noodle cake holder 24 via the illustrated gear 30.

Figure 4 is an exploded view of a two-part noodle cake break up device 32, here in the form of a crushing device. A noodle cake geometry type A with reference numeral 16 is received between the two parts 34 and 36. The two-part noodle cake break up device 32 comprises a fixed part 34 and a movable part 36. The movable part 34 is hinged to the fixed part 36 via a member or element 38. Two holding points 40 and 42 prevent an uncrushed dried noodle cake is from being dispensed into a user's receptacle.

Anvil parts 44 are provided at both parts 34, 36 of the two-part noodle cake break up device 32. The anvil parts 44 constitute further crushing points for communiting the noodle cake further.

Figure 5(a) illustrates the two-part noodle cake break up 32 device of Figure 4 in an assembled state. The two-part noodle cake break up device 34 of Figure 4 and 5(a) mainly performs a crushing action for breaking up the dried noodle cake 12, 14, 16.

Generally, the breaking up devices illustrated and discussed herein are arranged in the compartment 26 for breaking up the dried noodle cakes 12, 14, 16 into a multitude of pieces. There are at least two main ways for breaking up a noodle cake, namely crushing and cutting, and as well as a combination thereof. The dried noodle cakes 12, 14, 16 are generally broken or sub-divided to a degree selected by an operator.

The crushing system may be seen generally as comprising an activation component, an anvil, and a cutting/crushing element. When activated, the anvil will press the dried noodle cake against the cutting/crushing element effectively cutting/crushing the noodle cake and dispensing it at the same time into the receptacle placed immediately below the crushing system.

The right side of Figure 5(b) illustrates a two-part noodle cake break up device 46 employing crushing. An anvil 48 crushes the dried noodle cake 12, 14, 16 against a crushing element 50. The unbroken dried noodle cake is resting on supports 52 so that it is not dispensed. After the anvil 48 has crushed the dried noodle cake 12, 14, 16, the pieces 54 are dispensed into the receptacle 22, not illustrated in this figure.

The left side of Figure 5(b) illustrates a two-part noodle cake break up device employing a combination of crushing and cutting, whereby a cutting element 56 cuts the dried noodle cake 12, 14, 16 while it is being compressed by the anvil 48.

Figure 5(c) illustrates a two-part noodle cake break up device 60 employing crushing, where a handle 62 is operated by a user. As the user pushes the handle 62 upwards, a spring 64 is compressed. A support unit 66 engages a roller 68 so that, as illustrated in step 2 of Figure 5(c), the roller 68 is at the end of the support 66. When the roller 68 rolls over the end of the support 66, the anvil element 70 is accelerated towards the dried noodle cake with the spring 64 supplying extra force, providing a high impact force against the dried noodle cake. In step 4 of Figure 5(c), the user re-initiates the process by lowering the lever or handle 62 so that the support 66 of a trigger device re-engages the roller. The trigger device is discussed in more detail below.

Figure 5(d) schematically illustrates a break up device 80 utilising a spring 82 for returning the crushing element 84 to its initial position. Here, the user lowers the handle 86 so as to crush the dried noodle cake. The spring 82 forces the handle 86 upwards afterwards. The user may press down the handle 86 a number of times so as to break up the dried noodle cake into pieces of a desired size.

Figure 5(e) schematically illustrates a break up device 90 having a push-plate 92 for an operator to push to break up a dried noodle cake. Here, the user may push hard on the push plate 92, e.g. the user may hit the plate 92 a number of times to break up the dried noodle cake into pieces of a desired size. A spring 94 returns the push plate 92 to its initial position after the anvil 96 has performed a crushing operation on the dried noodle cake.

Figure 6(a) schematically illustrates a trigger device 100. The user has performed the action illustrated in Figure 5(c) and wishes to re-initiate the trigger device 100 by returning it to its initial position.

Figure 7(a) schematically illustrates constituent parts of one embodiment of a system 110 for breaking up dried noodle cakes 12, 14, 16. Apart from the magazine 10, 10', 10'', 10''', the dispensing part and the compartment 112 comprising a breaking up device 114 for breaking up the dried noodle cake as discussed above, the system 20

further comprises a receptacle holding station 26 for holding a receptacle 22 so as to receive the multitude of dried noodle cake pieces. The receptacle holding station 26 is adapted to temporarily hold a receptacle 22. The receptacle 22 may be a cup or a bowl. The receptacle holding station 26 is designated Cavity B in Figure 7.

5 Figure 7(b) schematically illustrates constituent parts of another embodiment of a system 120 for breaking up dried noodle cakes 12, 14, 16. Here, the crushing system 114 is similar to that discussed in connection with Figure 5(e).

10 Figure 8 schematically illustrates cutting parts or elements for a system for breaking up dried noodle cakes 12, 14, 16 by cutting. The cutting element comprises a number of knives. The knives are arranged in different configurations. Here, the cutting elements are illustrated as a single knife 122, a cruciform knife 124 and as three radial knives arranged at equally angles 126, about 180 degrees apart.

15 As mentioned above, Figure 9 schematically illustrates three possible geometric shapes of dried noodle cakes 12, 14, 16. The left-hand dried noodle cake B1, also designated 12, has a truncated conical/ frustoconical shape, while the left-hand dried noodle cake B2, also designated 14, has a cylindrical shape, and the right-hand dried noodle cake A, also designated 16, have a parallelepiped geometry.

20 The transfer of the dried noodle cake from the magazine/holder to the compartment is enabled through the dispensing mechanism 126. The noodle cakes 12, 14, 16 will be broken up, i.e. cut and/or crushed, using the crushing system 114 effectively dispensing the resulting noodle pieces from the compartment 112 into the receptacle 22 placed in the receptacle holding station 26.

25 The consumer will place a receptacle 22 into the receptacle holding station 26, activate the noodle cake dispensing system 126 to dispense a single dried noodle cake 12, 14, 16 into the compartment 112. Subsequently, the consumer will activate the break-up of the noodle cake to dispense the noodle pieces into the receptacle 22. The consumer can then proceed to a separate seasoning station to select his or her favourite flavour and add hot water to consume and enjoy.

30 As used in this specification, the words “comprises”, “comprising”, and similar words, are not to be interpreted in an exclusive or exhaustive sense. In other words, they are intended to mean “including, but not limited to”.

Further, any reference in this specification to prior art documents is not intended to be an admission that they are widely known or form part of the common general knowledge in the field.

It is to be appreciated that although the invention has been described with reference to specific embodiments, variations and modifications may be made without departing from the scope of the invention as defined in the claims. Furthermore, where known equivalents exist to specific features, such equivalents are incorporated as if specifically referred to in this specification.

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CLAIMS

1. A system for breaking up dried noodle cakes into noodle pieces and dispensing the noodle pieces, the system comprising:
 - 5 a magazine for storing a plurality of dried noodle cakes,
 - a compartment in communication with the magazine,
 - a noodle cake dispensing system for dispensing single dried noodle cakes from the magazine into the compartment in response to input from an operator,
 - a breaking up device for breaking up a dried noodle cake located in the
 - 10 compartment into noodle pieces, the dried noodle cake being broken up to a degree selected by the operator, wherein the system receives input from the operator in the form of a mechanical input or from an electronic input unit, and
 - a receptacle holding station for temporarily holding a receptacle for receiving the noodle pieces.
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2. The system according to claim 1, wherein the breaking up device is configured for crushing the dried noodle cake.
3. The system according to claim 1 or claim 2, wherein the breaking up device
 - 20 comprises two crushing elements arranged for crushing the dried noodle cake by compression.
4. The system according to claim 3, wherein one of the two crushing elements is in a fixed position and the other crushing element is movable to crush the dried noodle cake
 - 25 between the two crushing elements.
5. The system according to claim 3 or claim 4, wherein one or both of the crushing elements comprise(s) anvil part(s) for enhancing the crushing of the dried noodle cake.
6. The system according to claim 1, wherein the breaking up device is configured for
 - 30 cutting the dried noodle cake.
7. The system according to claim 6, wherein the breaking up device comprises a fixed cutting part and a movable pressing part arranged so as to press the dried noodle
 - 35 cake against the cutting part.

8. The system according to claim 7, wherein the cutting part comprises 1, 2, 3, 4 or more knife edges.
- 5 9. The system according to any one of claims 1 to 8, wherein the noodle cake dispensing system comprises a dried noodle cake holder for holding and dispensing a single dried noodle cake, the dried noodle cake holder being capable of rotating so as to dispense the dried noodle cake from the magazine to the compartment.
- 10 10. The system according to any one of claims 1 to 9, wherein the input from the operator to the noodle cake dispensing system includes operation of a gear.
11. The system according to any one of claims 1 to 10, wherein the dried noodle cake has a frustro-conical geometry, a cylindrical geometry or a parallelepiped shaped
15 geometry.
12. The system according to any one of claims 1 to 11, which comprises a lever for the operator to pull or push to provide the input to the noodle cake dispensing system.
- 20 13. The system according to any one of claims 1 to 11, wherein the noodle cake dispensing system comprises a computer device for receiving input from the operator.