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Petroske et al.

[15] 3,635,270

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[54] **COMBINATION CAN OPENER AND SLICING SHREDDING APPLIANCE**

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[51] Int. Cl. **B02c 18/00**

[58] Field of Search **146/91, 92, 3 G, DIG. 8; 30/123 R, 4, 6.5; 241/101 R**

2,713,367 7/1955 Aberer.....146/91
3,515,357 6/1970 Clark241/101 R

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[57] **ABSTRACT**

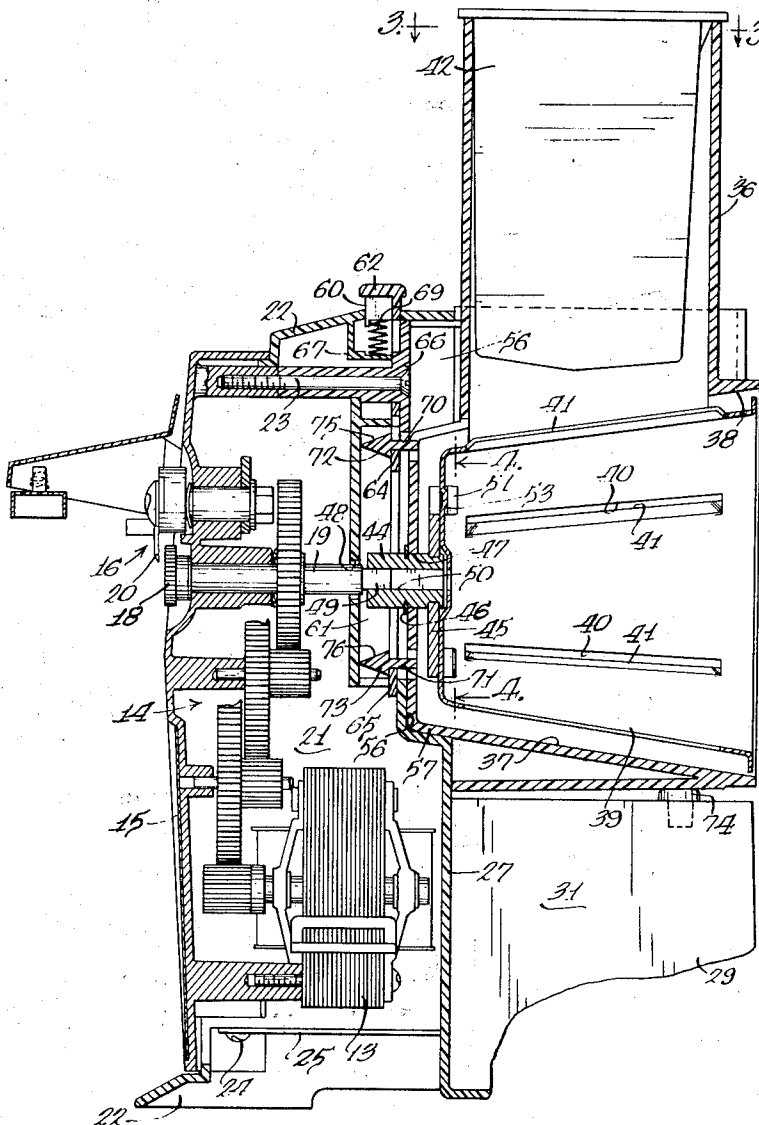
A can opener having combined therewith apparatus for shredding and slicing foods. The slicing and shredding apparatus consists of a detachable attachment which may be mounted in either of two alternative positions on the can opener housing. In one of the alternative positions, the slicing and shredding attachment is drivingly coupled to the can opener mechanism and the chute through which food is supplied is in an exposed position. The attachment is also provided with a storage position in which it is mounted on the can opener housing with the food delivery chute blocked and the slicing/shredding mechanism uncoupled from the can-opening mechanism.

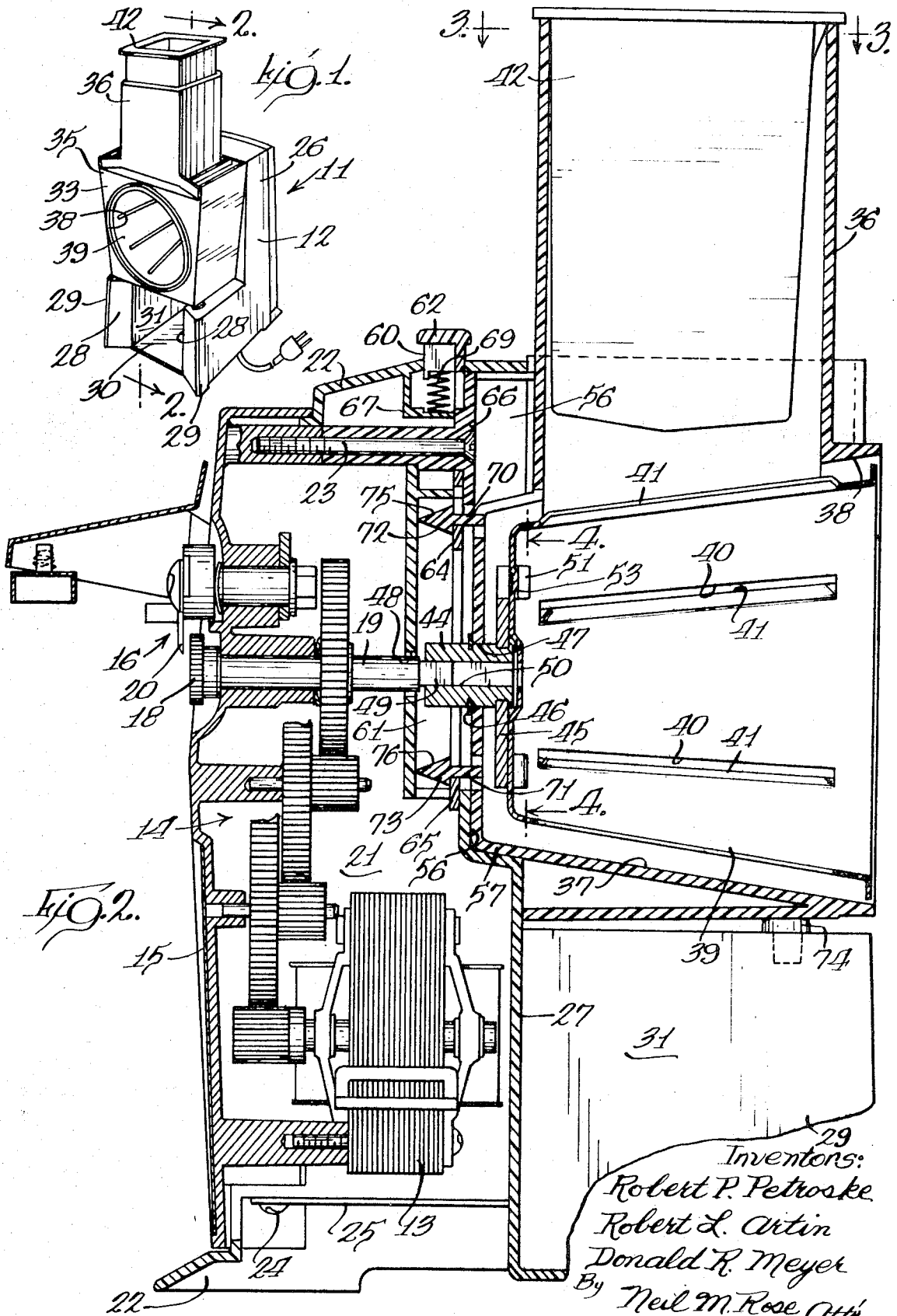
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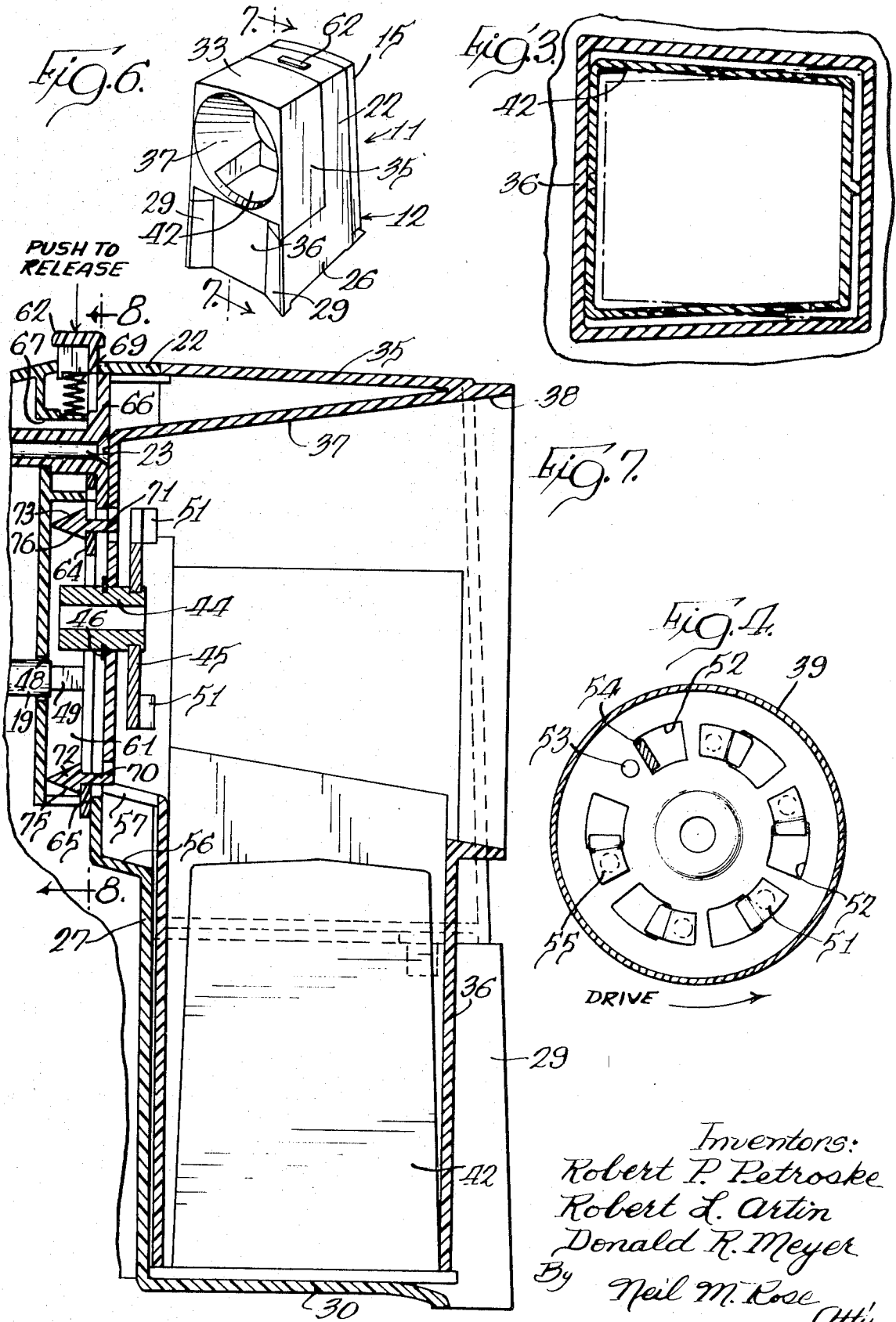
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15 Claims, 8 Drawing Figures

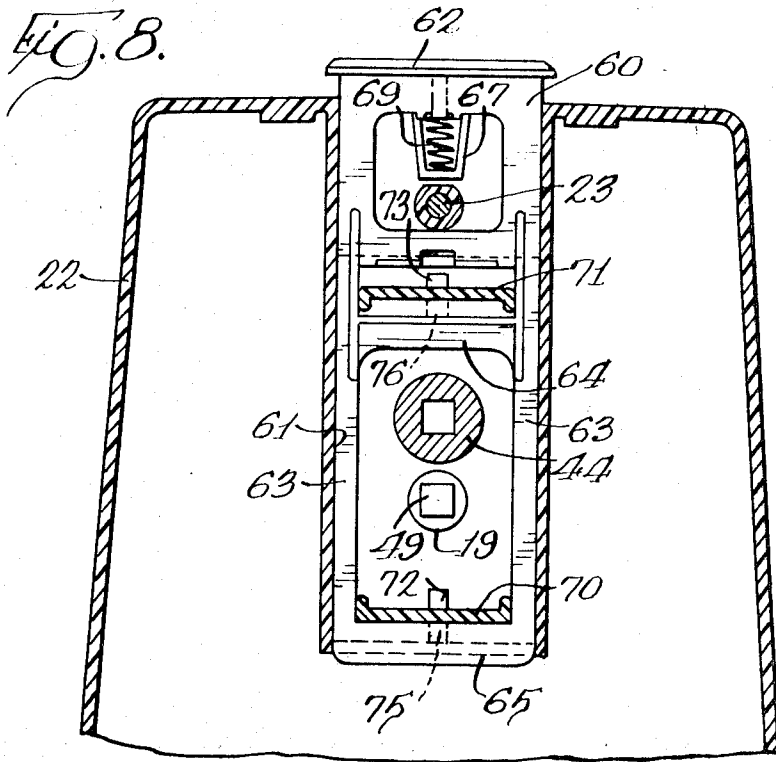
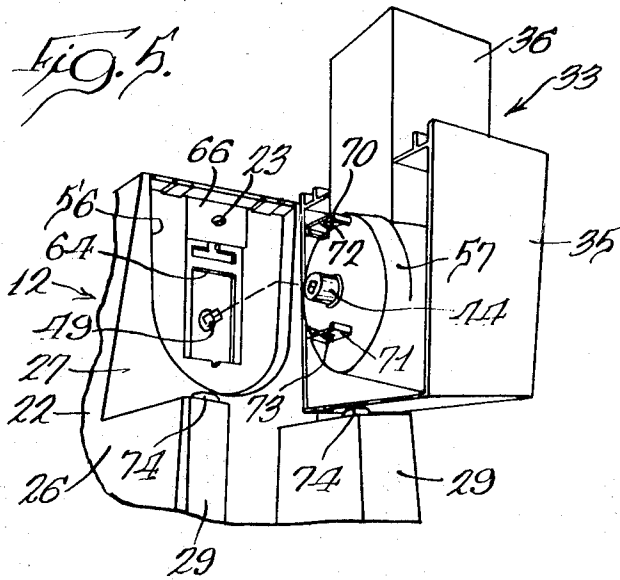




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COMBINATION CAN OPENER AND SLICING SHREDDING APPLIANCE

BACKGROUND OF THE INVENTION

With the increase in popularity of the electric can opener in recent years, there have been many attempts to adapt the can opener to perform additional functions other than the mere opening of cans. The resulting combination can opener appliances have been extremely popular since they permit the appliance to be used for purposes other than opening cans and provide these additional functions at little increase in cost. Examples of such combination can opener appliances are can opener/knife sharpeners, can opener/ice crushers, and can opener/citrus juice extractors. One such can opener/ice crusher appliance is disclosed and claimed in U.S. Pat. No. 3,515,357 which is assigned to the same assignee as the instant application.

In designing a combination appliance involving a can opener, it is important that the overall size and shape of the can opener be maintained at a minimum because of the obvious limitations in available counter space in most kitchens. Since the electric can opener is used frequently, the housewife normally feels compelled to maintain this appliance exposed on the counter where it is readily available for use. Accordingly, any additions or modifications in the can opener which would make it too bulky or unsightly to leave in this exposed condition on the counter would be very undesirable.

A slicing and shredding appliance is conventionally used in connection with the making of salads as well as for other food preparation chores in which food is to be either sliced or shredded. This type of appliance is inherently hazardous for the housewife to use since the cutting elements must be quite sharp with the result that they are quite capable of injuring the hands or fingers of the user who might accidentally encounter the cutters. Accordingly, safety means must be provided in connection with such an appliance to prevent or minimize the dangers of the user encountering the cutting elements.

It should also be noted that a slicing and shredding appliance is used rather infrequently as compared to a can opener. As a consequence, although a housewife might appreciate having a slicing and shredding appliance available, it need not be as readily usable as a can opener as long as it meets the requirements of safety. In addition, it is important that a slicing and shredding appliance be easily immersed in water for washing purposes since the corrosive juices associated with the foods and vegetables sliced and shredded therein would cause severe sanitary problems if not removed promptly from the appliance.

BRIEF DESCRIPTION OF THE INVENTION

The invention relates to a combination appliance which is adapted to perform the functions of opening cans and slicing and shredding food such as vegetables and cheeses. The can opening mechanism is generally conventional including a motor and reduction gearing which drives the means for rotating the can during the can-opening operation. The slicing and shredding portion of the appliance is enclosed in a secondary housing which is supported on the main housing in a manner so that it may be detached and connected in either of two alternative positions. The secondary housing includes a food delivery chute and a recessed portion within which is mounted a truncated conical cutter which is conventionally employed in slicing and shredding appliances. In one of the alternative positions of the secondary housing, the conical cutter is connected to be driven by an extension on the shaft which supports the can rotating wheel. In addition, in this position the secondary housing has the food delivery chute positioned so that food may be fed into cutting engagement with the conical cutter. In the other alternative position of the secondary housing, the cutter is disengaged from its driving relationship with the feed wheel shaft and the food delivery chute is positioned so that no food may be deposited therein. In this latter position, the secondary housing occupies a minimum space and is

nested in a compact manner against the main housing. Push-button latch means are provided to permit easy detachment of the secondary housing from the main housing so that the secondary housing may be readily switch from either of its two alternative positions.

Accordingly, it is an object of the present invention to provide an improved appliance which is adapted to open cans and to slice and shred food.

It is a further object of the present invention to provide a combined can opener and slicer/shredder having the slicing and shredding portion of the appliance contained in a detachable housing which may be mounted in either of two alternative positions.

It is another object of the present invention to provide an improved electrical appliance having a slicing and shredding portion thereof which is adapted to be supported in a use position in which the slicing and shredding mechanism is in driven relation to the appliance motor and the food delivery chute is positioned to receive food to be sliced or shredded, said portion also being adapted to be supported in a storage position in which the slicing and shredding mechanism is out of driven engagement with the appliance motor and the food delivery chute is blocked or obstructed.

It is a further object of the present invention to provide a combined can opener and slicer/shredder in which the slicer/shredder is enclosed within a secondary housing which may be mounted on the main can opener housing with the food delivery chute either extending vertically upwardly to receive food to be sliced or shredded or extending vertically downwardly where the chute is blocked from the insertion of food and where it is nested compactly against the can opener housing.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out in the claims annexed to and forming a part of the specification.

DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, reference may be had to the accompanying drawings in which:

FIG. 1 is a perspective view of a combined can opener and slicing/shredding appliance embodying our invention;

FIG. 2 is an enlarged sectional view taken substantially on line 2-2 of FIG. 1;

FIG. 3 is a fragmentary sectional view taken on line 3-3 of FIG. 2;

FIG. 4 is a fragmentary sectional view taken on line 4-4 of FIG. 2;

FIG. 5 is an exploded perspective view illustrating the manner in which the slicer/shredder portion of the appliance detaches therefrom;

FIG. 6 is a perspective view showing the slicer/shredder portion of the appliance in its storage position;

FIG. 7 is an enlarged fragmentary sectional view taken on line 7-7 of FIG. 6; and

FIG. 8 is a fragmentary sectional view taken substantially on line 8-8 of FIG. 7.

SUMMARY OF THE INVENTION

Referring to the drawings there is shown a combined can opener and slicing and shredding appliance which has been designated generally by reference numeral 11. The appliance 11 includes a main housing 12 which is somewhat L-shaped and encloses a motor 13 and a gear reduction train 14. The housing 12 is formed by a front frame member 15 which supports the motor 13 and the gear train 14 on its inner surface and at the upper end thereof supports a can opening mechanism 16 which is driven by the motor 13 through the gear reduction 14. The can opener mechanism 16 is disclosed and claimed in copending Arel et al. application Ser. No. 49,258, filed June 24, 1970, entitled AUTOMATIC ELEC-

TRIC CAN OPENER, and assigned to the same assignee as the instant application. Since the specific form of the can opener mechanism 16 is of little consequence as regards the invention disclosed and claimed herein, it is sufficient to indicate that it includes a feed wheel 18 carried by a shaft 19 which is driven at a slow speed to rotate a can being opened through the engagement of the feed wheel 18 with the lip of the can. While the can is being rotated by the wheel 18, a suitable cutter 20 is engaged with the can to sever the cover therefrom.

In order to form a compartment 21 within which the gear train 14 and motor 13 are enclosed, the housing 12 is further provided with a plastic cover member 22 which is secured to the front frame 15 by means of assembly screws 23 and 24 engaging the upper and lower portions, respectively, of the frame 15. The lowermost assembly screws 24 extend upwardly through a bottom plate 25, through the cover member 22, and into threaded engagement with portions of the front frame 15, as shown in FIG. 2. The plate 25 thus forms a closure for the bottom of the compartment 21.

The cover member 22 is formed with somewhat L-shaped sidewalls 26 which are connected together by a transversely extending rear wall 27 as is best shown in FIG. 5. Extending inwardly from the rearwardly projecting portions of sidewalls 26 are wall portions 28 which define a pair of spaced buttresses 29. The buttresses 29 are spaced apart and interconnected at their lower edges by a web or floor 30 forming a cavity or recess 31. The buttresses 29 serve as stabilizers or supports for the housing 12 and also serve as supporting means for a secondary housing 33 which forms a part of the slicing and shredding portion of the appliance 11. The housing 33 may be assembled or affixed to the main housing 12 in two alternative positions which are shown in FIGS. 1 and 6. In both of these positions, however, the secondary housing 33 is supported by the spaced buttresses 29.

The secondary housing 33 includes a body portion 35 from which a food or material delivery chute 36 extends. The body portion 35 is formed with a conical recess 37 which faces rearwardly having a rearwardly opening mouth 38. The food delivery chute 36 extends vertically connecting with or entering into the recess 37 as is shown in FIG. 2.

For the purpose of slicing and shredding material moving down through the chute 36, there is mounted within the recess 37 a truncated metal cone 39 which is formed with slots 40, the edges of which are defined by sharpened knife edges 41. Thus, as the cone 39 is rotated, the outwardly protruding knife edges 41 slice into the material entering recess 37 through the chute 36. The slices of food are then received within the cone 39 and, as the food builds up within the cone, the sliced material is forced outwardly through the mouth 38 of the recess 37. A suitable container may be positioned against the outer ends of the buttresses 29 permitting the container to be positioned beneath the edge of the secondary housing 33 and the cone 39. Received within the upper end of the chute 36 is a molded plastic pusher 42 which may be used to apply pressure to force food downwardly through the chute 36 into engagement with the slicer cone 39.

In order to drive the cone 39, there is provided a drive hub 44 which is mounted for rotation in an opening 47 formed in the body portion 35 of the secondary housing 33, as best shown in FIGS. 2 and 7. The hub 44 includes a drive sprocket 45 positioned within the recess 38 and a C-shaped retaining ring 46 which is received in a groove in the hub 44 immediately adjacent the outer wall of the body portion 35. The hub 44 is thus loosely retained in the opening 47 by the spaced C-ring 46 and the sprocket 45.

The power takeoff from the gear train 14 to the splicing and shredding portion of the appliance 11 consists of the extended end of the shaft 19 which protrudes through an opening 48 formed in the rear wall of the main housing 12, the outer end of the shaft 19 being formed with a squared off portion 49 which is received within a correspondingly formed hole 50 in the hub 44. Thus, when the feed wheel shaft 19 is driven by

the motor 13, the hub 44 and the drive sprocket 45 are rotated by virtue of the interengagement between portion 49 and square hole 50.

The sprocket 45 includes a plurality of formed tabs 51 which are displaced from the main plane of the sprocket and extend peripherally for a short distance. The end wall of the cone 39 is formed with a plurality of openings 52 which are positioned to receive the L-shaped tabs 51 for the purpose of retaining the cone 39 assembled to the drive sprocket 45. To accomplish the assembly of the cone 39 to the sprocket 45, the cone is moved axially against the sprocket 45 with the tabs 51 in registry with the holes 52. After the cone has moved into abutting engagement with the sprocket 45, it is rotated clockwise, as shown in FIG. 4, thus causing the L-shaped tabs 51 to overlap the portions of the cone 39 between the holes 52 thereby retaining the cone 39 against axial displacement with respect to the sprocket 45.

In order to restrict rotary movement of the cone 39 with respect to the sprocket 45 after the above-described assembly operation has been performed, the vertical or inner wall of the cone 39, as it is positioned in recess 37, is formed with small, projecting dimples 53 which engage the inside faces of the tabs 51 providing an easily controlled interference between the sprocket 45 and the cone 39. This interference prevents accidental removal of the cone 39. Prior art slicers and shredders have relied on the angled disposition of the tabs 51 to create a wedging or jamming action which would lock the slicing and shredding cone with respect to its mounting hub. Such an arrangement was unsatisfactory in that the parts tended to become locked or jammed together tightly during use of the appliance and, therefore, were difficult to remove. In the above-described arrangement, the dimples 53 provide all the retaining function necessary and this retaining force tends to remain constant and unaffected of any jamming of the parts during use. The L-shaped tabs 51 are formed with outwardly extending legs 54 and peripherally extending portions 55. By having the legs 55 extending substantially parallel to the axis of the cone 39, there is no tendency to achieve the undesirable wedging effect or jamming which characterizes the prior art.

To better understand the manner in which the secondary housing 33 is assembled to the main housing 12, reference should be made to FIG. 5 wherein it can be seen that the transverse rear wall 27 of the main housing is formed with a shallow recess 56 which is adapted to receive a cylindrical wall portion 57 formed on the mating face of the secondary housing 33. In order to lock the secondary housing 33 in assembled position against the housing 12, there is provided a latch member 60 which is slidably receive in an elongated slot 61 formed in the bottom of the recess 56 on the main housing 12. The latch member 60 is a vertically extending member having an exposed pushbutton 62 on its outer end, a pair of vertically extending guide rails 63, and transversely extending bar portions 64 and 65 located near the midpoint and bottom, respectively, of the latch member 60. The latch member 60 is retained in position for vertical sliding movement within the slot 61 by means of a retainer 66 which is secured in position overlying the top of the latch member 60 by the assembly screw 23 which, as mentioned above, retains the cover 22 against the frame 15, as is best shown in FIG. 2. The bottom end of latch member 60 is received behind the wall 27 to retain it and guide it through its limited vertical sliding movement. The cover 22 is formed with a pocket 67 positioned immediately below the button 62 and adapted to receive a biasing spring 69 which urges the latch member 60 upwardly as shown in FIGS. 2, 7, and 8.

Adapted for cooperative engagement with the latch member 60 are upper and lower latch projections 70 and 71 formed on the cylindrical portion 57 of the secondary housing 33 as are best shown in FIG. 5. The projections 70 and 71 are formed with wedge-shaped downwardly extending catches 72 and 73, respectively, which lock behind the transversely extending crossbars 64 and 65 formed on the latch member 60

when the housing 33 is assembled in the use position as shown in FIG. 1. Thus, as the secondary housing 33 is applied to the rear face of the main housing 12 with the cylindrical portion 57 extending into the recess 56, the latch projections 62 extend into engagement with the latch member 60 with the sloping faces of the catches 72 and 73 causing the latch member 60 to be biased downwardly until the catches 72 and 73 have been inserted beyond the crossbars 64 and 65. At this point, the biasing spring 69 urges the latch member 60 upwardly behind the vertical rear surfaces of the catches 72 and 73 thereby locking the secondary housing 33 in assembled relationship to the main housing 12.

In this assembled use position, the outwardly extending portion of the secondary housing 33 is supported on a pair of spaced bumpers 74 which are mounted on the upper faces of the buttresses 29, as clearly shown in FIGS. 2 and 5. When it is desired to detach the secondary housing 33 from the main housing 12, it is merely necessary to depress the latch member 60 by pressing downwardly on the exposed pushbutton 62 thereby disengaging the crossbars 64 and 65 from the latch projections 70 and 71, thus permitting removal of the secondary housing 33. In the use position as shown in FIG. 2, the food delivery chute 36 extends upwardly, and the shaft 19 is in driving engagement with the hub 44 so that when the motor 13 is actuated, the cone 39 will be rotated in order to slice and shred food.

Since the slicing and shredding portion of the appliance 11 is used only infrequently, it is desirable to provide means for storing the secondary housing 33 in a compact position and in a manner to minimize the hazards which are normally associated with devices of this type. According to the instant invention, the secondary housing 33 may be detached from the mounted position shown in FIG. 2 and reassembled to the main housing 12 in the position shown in FIGS. 6 and 7. In this position, the food delivery chute 36 extends vertically downwardly and is received between the buttresses 29 with the bottom web or floor 30 lying immediately below the mouth of the chute 36. The food pusher 42 is received within the chute 36 and may be stored as shown in FIG. 6.

To facilitate the retention of the pusher 42 within the chute 36, the pusher 42 is formed with angled walls so that in the solid line position shown in FIG. 3, there is a clearance between the walls of the pusher 42 and the chute 36. When the pusher is reversed to the dotted line position shown in FIG. 3, there is a wedging action resulting which retains the pusher 42 within the chute 36. Thus, when one is removing the secondary housing 33 with the intent of remounting it on the main housing 12 in the storage position shown in FIG. 6, the food pusher 42 is mounted in the dotted line position shown in FIG. 3 so that as the secondary housing 33 is inverted, the pusher 42 will be retained within the chute 36 as the secondary housing is moved to the storage position shown in FIGS. 6 and 7.

When the secondary housing 33 is moved to this storage position, the latch projections 70, 71 each have a second catch 75, 76, respectively, which correspond to the catches 72, 73 but extend outwardly from the opposite sides of the latch projections 70, 71. The result of the two oppositely extending catches is a somewhat arrowhead configuration as is shown in FIGS. 2 and 7. When the secondary housing 33 is moved to the storage position, the catches 75, 76 engage the crossbars 65 and 64, respectively, thereby deflecting the latch member 60 downwardly and permitting the latch projections 70, 71 to move into latched engagement with the latch member 60, as shown in FIG. 7.

It should be noted that in the storage position as shown in FIG. 7, the drive hub 44 is positioned above and out of engagement with the outwardly extending end of the shaft 19. Accordingly, in the storage position the slicer/shredder portion of the appliance is completely inoperative. The sprocket 45 is not rotated, so even that if there were a cone 39 assembled thereto, it would present no hazards as far as actual engagement with the knife edges 41 is concerned. In addition, the food delivery chute 36 is positioned between the but-

tresses 29 and with the bottom web or floor 30 blocking the entrance to the chute 36. Therefore, in the storage position, the slicing and shredding portion of the appliance 11 occupies a minimum amount of space and presents no hazards whatsoever.

While there has been shown and described a particular embodiment of the present invention, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the invention in its broader aspects, and it is, therefore, contemplated in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the present invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A combined can opener and shredding appliance comprising a main housing including a motor and gear reduction which is drivingly connected to a can-opening mechanism, said can-opening mechanism being supported on said main housing, a secondary housing adapted for selective mounting on said main housing in either of two alternative positions, a power takeoff driven by said gear reduction, a shredder assembly mounted for rotation in said secondary housing, said shredder assembly being driven by said power takeoff when said secondary housing is in a first position in which said shredder assembly is positioned to receive material to be shredded, said secondary housing being adapted to mount on said main housing in a second position in which said shredder assembly is blocked from receiving material.

2. The combination of claim 1 wherein said secondary housing includes a laterally opening recess within which said shredder assembly is mounted for rotation about a horizontal axis, a material delivery chute extending vertically from said recess, said chute extending upwardly when said secondary housing is in said first position and downwardly when in said second position.

3. The combined can opener and shredding appliance of claim 1 wherein said secondary housing is selectively mounted on said main housing by latching means including a spring-biased latch member mounted on one of said housings, said latch member being manually actuatable to slide vertically in opposition to a biasing spring, vertically spaced latch projections on the other of said housings positioned to engage said latch member and lock said housings together, manual actuation of said latch member releasing said projections for separation of said housings.

4. The combined can opener and shredding appliance of claim 3 wherein said projections include camming portions to move said latch member in opposition to said spring as said housings are moved into engagement with each other, said projections engaging said latch member and locking said secondary housing to said main housing in either of said alternative positions.

5. A slicing and shredding appliance comprising an upstanding main housing enclosing a motor and reduction gearing drivingly connected to said motor, a power output coupling driven by said gearing and positioned to drive a detachable slicing and shredding mechanism, a secondary housing enclosing said mechanism, means for detachably supporting said secondary housing on said main housing in either of two alternative positions, said secondary housing having a food delivery chute extending upwardly in one of said alternative positions, said mechanism including a rotating cutting element accessible through said chute and in driven engagement with said coupling when said secondary housing is in said one position, said cutting element being disengaged from said coupling when said secondary housing is in the other of said alternative positions.

6. The slicing and shredding appliance of claim 5 wherein said chute in said one position extends upwardly beyond the top of said main housing, said chute extending downwardly when said secondary housing is mounted in said other alternative position, said secondary housing extends vertically substantially coextensive with said main housing in said other position. purposes.

7. The slicing and shredding appliance of claim 6 including an elongated member shaped to be slidably received in said chute for pushing food therein against said cutting element, wall portions on said main housing positioned below the mouth of said chute when said secondary housing is in said other position to retain said member within said chute for storage purposes

8. The slicing and shredding appliance of claim 5 wherein said mechanism includes a rotatable hub having a flat body portion with a plurality of peripherally spaced and peripherally extending fingers which are displaced from the plane of said body portion, said cutting element comprising a truncated cone having an open base and mounting plate at the top thereof, said plate having spaced slots to receive said fingers and upon rotation of said cone with respect to said hub causing said fingers to lock into engagement with the inner face of said plate.

9. The slicing and shredding appliance of claim 8 wherein said fingers extend parallel to the plane of said body portion, and dimpled projections on said plate positioned to engage said fingers in the locked position of said cone relative to said hub.

10. A combination appliance including a can opener and an attachment, the improvement comprising an upstanding main housing enclosing a motor and reduction gearing and having spaced supporting buttresses extending outwardly therefrom, means mounting said attachment in either of two alternative positions on said main housing, one of said positions being an operative position in which said attachment is drivingly coupled to said reduction gearing and is supported resting on top of said buttresses, the other of said alternative positions being a storage position in which said attachment is uncoupled from said reduction gearing and secured to said main housing inverted from said operative position with a portion of said attachment nested between said buttresses.

11. The combination appliance of claim 10 wherein said attachment comprises a slicer and shredder including a conical cutter mounted for rotation in a recess in a secondary housing, a food delivery chute on said secondary housing extending outwardly from said recess, said chute in said storage position

extending downwardly between said buttresses and in said operational position extending upwardly to receive food.

12. The combination appliance of claim 11 including a separate food advancing member which is slidably received in said chute to force food therethrough, a web positioned between said buttresses and serving to retain said member stored within said chute when said attachment is mounted in said storage position.

13. In a slicing and shredding appliance the improvement comprising a housing having a sidewardly opening recess formed to detachably receive alternatively driven cutting elements for slicing and shredding, each of said cutting elements having a truncated conical shape with an open base and a top mounting plate, the sloping sides of said elements being formed with spaced cutting edges, a drive hub mounted in the bottom of said recess horizontally spaced inwardly from the opening to said recess and rotatable about a horizontal axis, said hub having a plurality of peripherally spaced integrally formed fingers, said fingers extending peripherally in a plane parallel to and spaced from a flat vertically extending body portion of said hub, said fingers having axially extending mounting portions and being positioned to register and extend through spaced openings in said plate, rotation of said plate with respect to said hub locking said element in a mounted position coaxial with said horizontal axis, said plate having spaced rounded projections positioned between said spaced openings to engage said fingers, the engagement between said projections and said fingers restraining said element and hub against relative rotation.

14. The combination of claim 13 wherein the extent of relative rotation between said hub and said plate with said fingers extending through said spaced openings is limited by engagement of said mounting portions with the plate portions defining the ends of said spaced openings.

15. The combination of claim 14 wherein said projections are formed as a section of a sphere so that said fingers are deflected as said element is rotated into locked engagement with said hub and said projections make contact over a very small area with said fingers.

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