Jan. 14, 1930. W. J. CAMPBELL 1,743,113

SLICING MACHINE

Filed March 14, 1928

Fig. 1.

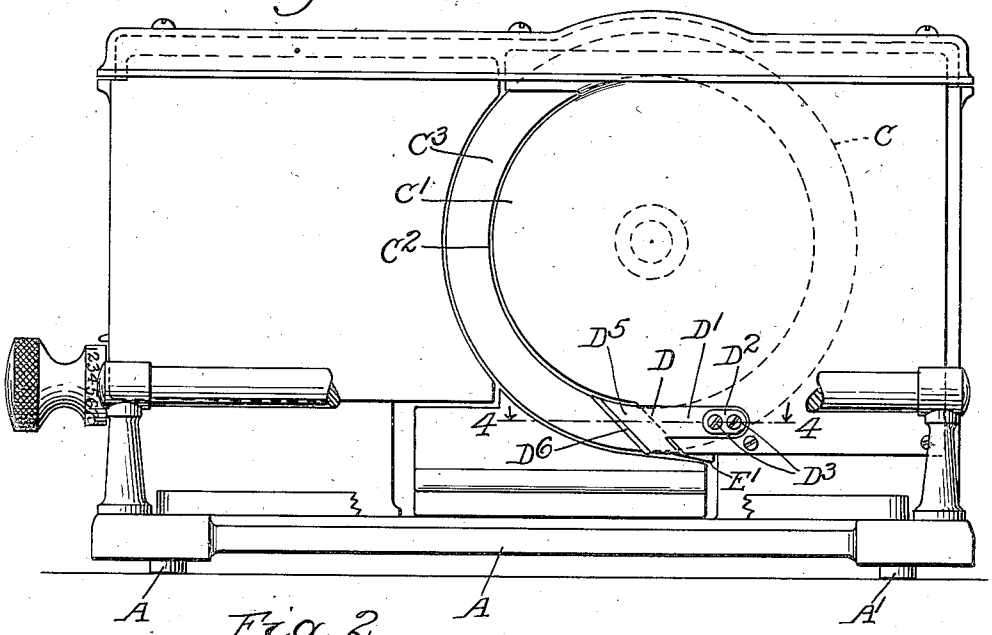


Fig. 2.

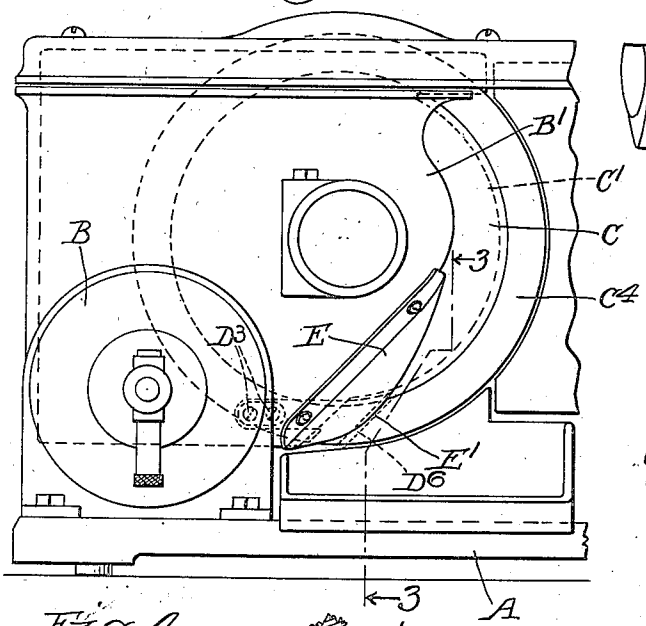


Fig. 3.

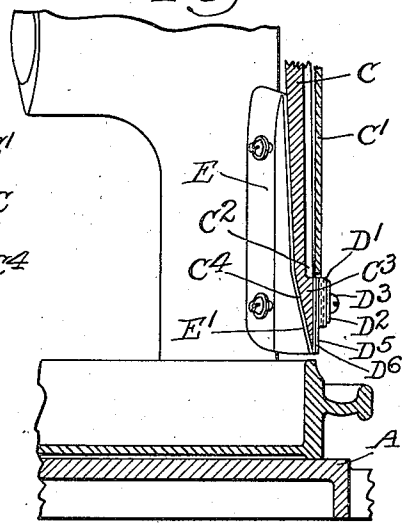
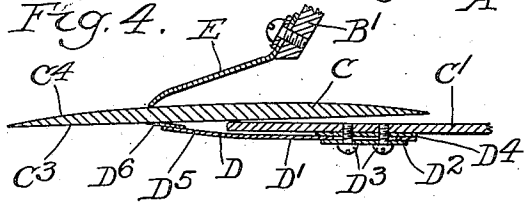


Fig. 4.



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UNITED STATES PATENT OFFICE

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SLICING MACHINE

Application filed March 14, 1928. Serial No. 261,499.

My invention relates to a slicing machine and particularly to a machine for slicing meat and has for one purpose the provision of a scraper blade or scraper member which shall operate against the face of the knife in order to remove bits of meat, grease and the like therefrom. An object of my invention is the provision of such a blade which shall have a life of maximum duration, and which shall cause a minimum of noise. Another object is the provision of such a blade which shall conform to irregularities in the face of the knife and which shall conform to the rhythm of rotation of the knife. Other objects will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a front elevation of my device;

Figure 2 is a partial rear elevation;

Figure 3 is a section on the line 3—3 of Figure 2; and

Figure 4 is a section on the line 4—4 of Figure 1.

Like parts are indicated by like symbols throughout the specification and drawings.

A generally indicates any suitable base frame or member provided, for example, with the anti-frictional and noise-deadening supports A^1.

Mounted on such base member is any suitable motor means, herein shown as the motor B, from which extends any suitable driving connection to the rotary knife herein shown as C. Positioned in the forward side of the knife is a face plate C^1 which penetrates or partially penetrates the hollow C^2 formed in the forward face of the knife. It will be observed, for example in Figure 3, that the knife is provided with a peripheral forward raised portion C^3 and an inclined rear portion C^4, the two converging to form the cutting edge of the knife. In order to throw the cutting edge outwardly beyond the face of the face plate C^1 the knife is tilted out of parallelism with the face plate, in order to throw one edge forward, as shown in Figure 3. I may employ any suitable means, not herein shown, for conveying meat across the face of the knife and face plate C^1, and thus into engagement with the cutting edge of the knife. B^1 indicates a shield or housing member for the rear of the knife.

In order to free the face and edge of the knife from bits of meat, grease and the like which might tend to penetrate to the rear of the face plate C^1 I provide a scraping member, generally indicated as D, which includes a stem or body portion D^1 secured as at D^2, to the face plate C^1, for example by the screws D^3. It will be understood that by the use of shims or the like D^4 or washers of suitable thickness, the member D^1 may be adjusted in relation to the face plate C^1 and the cutting plane of the knife.

It is here shown as terminating in a species of head or T D^5, to the edge of which is secured a flexible steel blade D^6. I may employ, for example, the blade, or part of the blade, of a safety razor or any other equivalent member. It is essential that I provide a thin flexible resilient sharp, scraping edge the length of which is preferably very slight in relation to its width. In effect it is a mere fringe of highly yielding spring steel positioned upon the head D^5 and its body portion D^1 which are preferably also of spring stock.

To the rear of the knife, positioned for example upon the housing B^1 I employ a scraper or deflector E. It will be observed that its edge E^1 engages the knife well within the periphery and extends outwardly toward and beyond the periphery. Similarly the edge of the scraper D^6 engages the knife starting well within the periphery and extending to the periphery of the knife. In each case the contour of the scraper is such as to provide an outwardly inclined edge in relation to the path taken by any individual particle as it rides about on the knife. The result is that these particles as they are loosened by the opposed scrapers tend to be moved outwardly toward the edge of the knife and to be discharged therefrom. It will also be observed that the two scrapers, extending as they do beyond the periphery of the knife are practically hid beneath the knife, or at least occupy more or less overlapping planes, so that no free space is left between them

through which particles could readily be carried into the interior of the housing.

It will be realized that whereas I have described and shown a practical and operative device nevertheless many changes might be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as in a broad sense illustrative and diagrammatic rather than as limiting me to my specific showing.

The use and operation of my invention are as follows:

It is extremely desirable to prevent the entry of portions of meat or other material into spaces behind the guard plate C^1 or the shield portion B^1. It will be observed that the knife is recessed on its forward face, and that the guard plate C^1 penetrates the recess. It therefore follows that any bits or crumbs of material which pass across the front or rear face of the knife will engage either the guard plate C^1 or the shield B^1, and access to the space behind the guard plate or shield will thereby be prevented.

In order to supplement the consequent disposal of such fragments and to clear the edge of the knife itself, I provide the deflector or scraper E which may closely engage or may positively scrape the inner face C^4 of the periphery of the knife. It is provided with a peripherally extending edge E^1.

I also find it desirable to provide a scraper for the front of the knife and have indicated the scraper member shown in Figure 4, which opposes an inclined blade D^6 to the exposed flat portion C^3 of the knife.

The above described scraper for the forward face or edge of the knife is peculiarly efficient for its purpose and obviates many difficulties which are present when scrapers of heavy spring steel, fiber, or the like are employed. In its essence the member includes two distinct parts namely the portion D^1 with the head D^5, which is preferably but not necessarily of some spring stock, and which preferably has some spring action, and the blade proper D^6, which not merely has spring action, but is of such thinness and is of such short width or length in relation to the elongated member D^5 as to be capable of vibrating at a very rapid rate.

Being in the form of a narrow flexible strip of metal it is also possible for waves of vibration to pass transversely along its edge across the face of the knife. In its employment the more rigid portion D^1 D^5 is so adjusted, in relation to the plate C^1 and the knife itself as to position the razor blade D^6 in close proximity to, and preferably in slightly yielding contact with the face of the knife. Since the knife normally rotates at a very rapid rate, for example at 800 R. P. M. clearly the inevitable slight inaccuracies of the face of the knife, whether caused by irregularities in the surface of the knife or by some slight variation of its axis of rotation from perpendicularity to the plate C^1, cause variations in the distance between the face of the knife at any given point and the scraper opposed thereto. Because of the rapidity of the rotation of the knife these variations are in the nature of a very rapid pulsation or vibration toward and away from the scraper. Unless the scraper member is able to conform to these vibrations it is inevitable that the distance between scraper and knife will vary and that fine particles will be carried between scraper and knife. On the other hand if a scraper member is thrust against the plane of the knife sufficiently closely to hug the knife, then there is the probability if not certainty of friction and overheating, of wear to the opposed parts, of wastage of power, and of increase in noise. I avoid these eventualities by employing the duplex member above described in which the more rigid portion D^1 D^5 exerts a certain yielding action and can conform to major variations or fluctuations, while the small spring strip or blade D^6 is so light and so flexible that it conforms readily to the rapid vibration of the knife.

In practice it may be said to get in resonance with the vibration of the knife face. It conforms to the rate and length of vibration of the knife. Nevertheless, notwithstanding its close hugging of the surface of the knife, the frictional contact, the force of the contact, and the area of the contact are insufficient to cause any substantial degree of wear or heating. The scraper itself remains cool to the touch, and it wears down very slowly. It has been applicant's experience that although many thousand slicing machines built in accordance with the teachings of the present application have been put in use, and some of them have been in use for many months, nevertheless it has been necessary to replace scrapers of this type, whether for wear or for any other reason, in only a scant dozen or two cases.

The action of the scraper blade in hugging the face of the knife and in lifting from it small bits of meat, grease and the like is aided by the fact that the knife edge is inclined to the path taken by any particle on the knife in such fashion that it tends to move these particles outwardly toward the periphery of the knife edge where they are easily sloughed off.

I claim:

1. In a slicing machine, a knife and means for rotating it and a scraper member adapted to engage the face of said knife, said scraper member including a body portion of spring stock and a scraper blade of spring stock mounted thereon, the scraper blade being sub-

stantially thinner than the body portion.

2. In a slicing machine, a knife and means for rotating it and a scraper member adapted to engage the face of said knife, said scraper member including a body portion and a thin, short scraper blade mounted thereon, the edge of the scraper blade having a high degree of flexibility.

3. In a slicing machine, a knife and means for rotating it, a scraper member adapted to engage the face of said knife, said scraper member including a flexible body portion and a scraper blade rigidly mounted upon said body portion, said scraper blade being of thin spring stock, more flexible than the body portion.

4. In a slicing machine, a knife and means for rotating it, a scraper member adapted to engage the face of said knife, said scraper member including a body portion and a scraper blade rigidly mounted upon said body portion, said scraper blade being of thin spring stock, and having a scraping or cutting edge, opposed to the face of said knife, of great width in relation to the length of the scraper blade, the thickness of the scraper blade, in relation to the width of its scraping edge being such as to provide a highly flexible edge portion.

5. In a slicing machine, a circular knife and means for rotating it, and a scraper member adapted to engage the face of said knife, said scraper member including a flexible body portion and a flexible scraper blade upon said body portion, the blade being more flexible than the body portion.

6. In a slicing machine, a circular knife and means for rotating it, and a scraper member adapted to engage the face of said knife, said scraper member including a flexible body portion and a flexible scraper blade mounted upon said body portion, the blade being more flexible than the body portion, said body portion and blade lying in generally parallel planes.

7. In a slicing machine, a circular knife and means for rotating it, and a scraper member adapted to engage the face of said knife, said scraper member including a flexible body portion and a flexible scraper blade mounted upon said body portion, the blade being more flexible than the body portion, the scraper blade being of thin spring stock.

8. In a slicing machine, a circular knife and means for rotating it, and a scraper member adapted to engage the face of said knfe, said scraper member including a flexible knife engaging portion adapted to be in resonance with the vibration of the knife during the normal operation of the machine.

9. In a slicing machine, a knife and means for rotating it, and a scraper member adapted to engage the face of said knife, the scraper member including a flexible knife engaging portion adapted, in response to vibration of the knife, to maintain a sympathetic vibration during the normal operation of the machine.

10. In a slicing machine, a rotary knife and means for rotating it, a thin resilient and readily flexible scraper adapted to engage the face of the knife adjacent the cutting edge, and a more sturdy, but resilient carrier for said scraper.

Signed at Indianapolis, county of Marion and State of Indiana, this 7th day of March, 1928.

WILLIAM J. CAMPBELL.