

Dec. 28, 1937.

W. A. VAN BERKEL

2,103,567

SLICING MACHINE

Filed Nov. 5, 1934

2 Sheets-Sheet 1

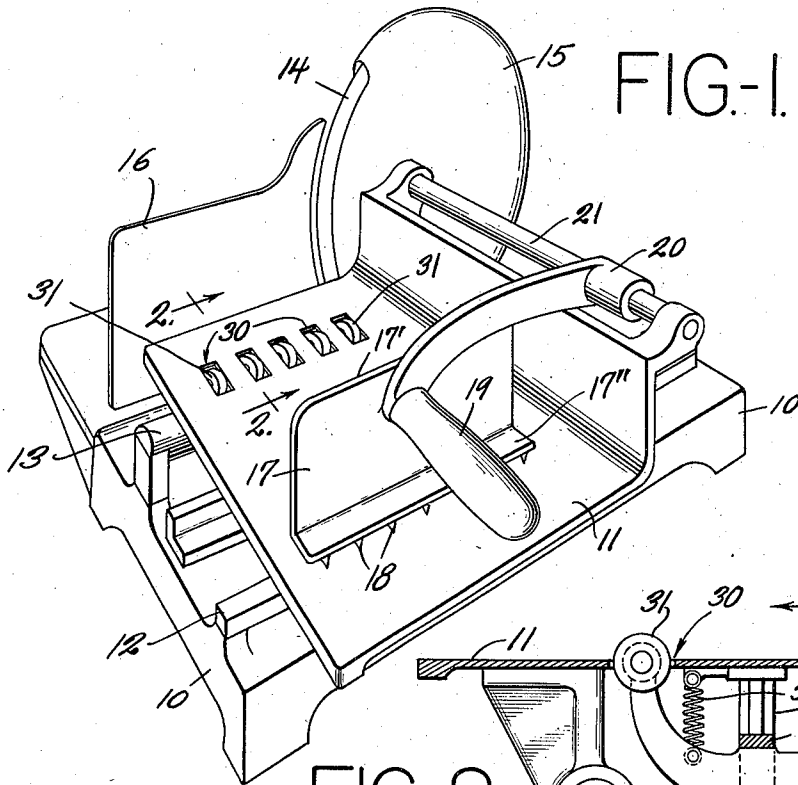


FIG. 1.

FIG. 2.

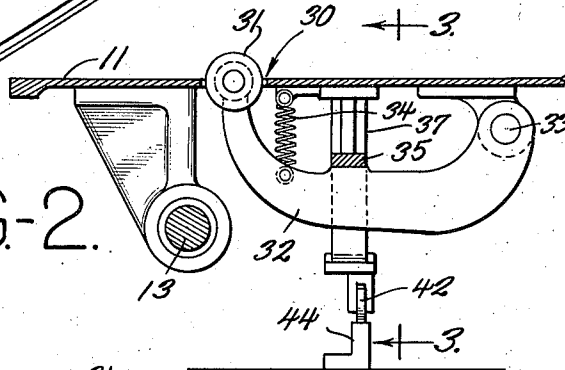
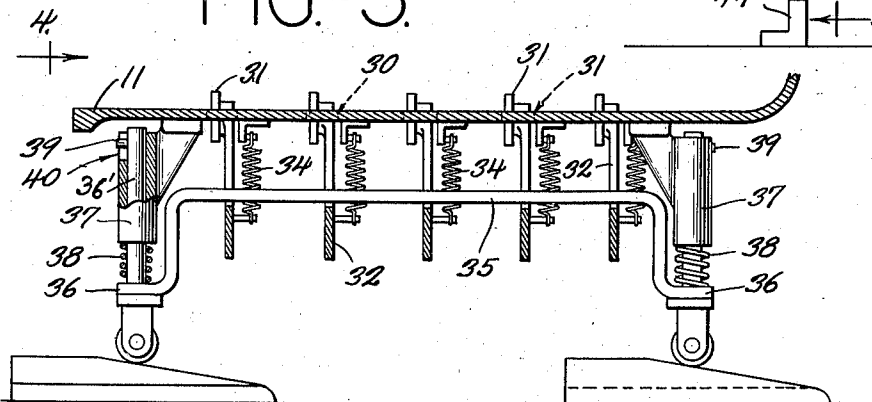


FIG. 3.



INVENTOR:

WILHELMUS ADRIANUS VAN BERKEL

BY

Cox & Moore

ATT'YS.

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FIG-4.

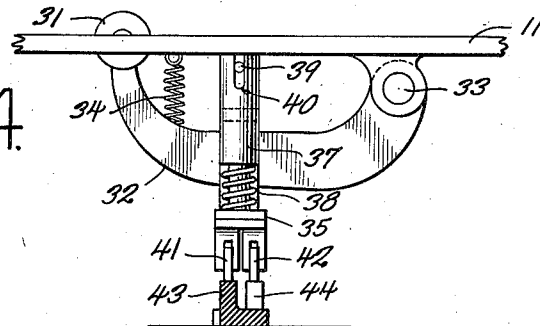


FIG-5.

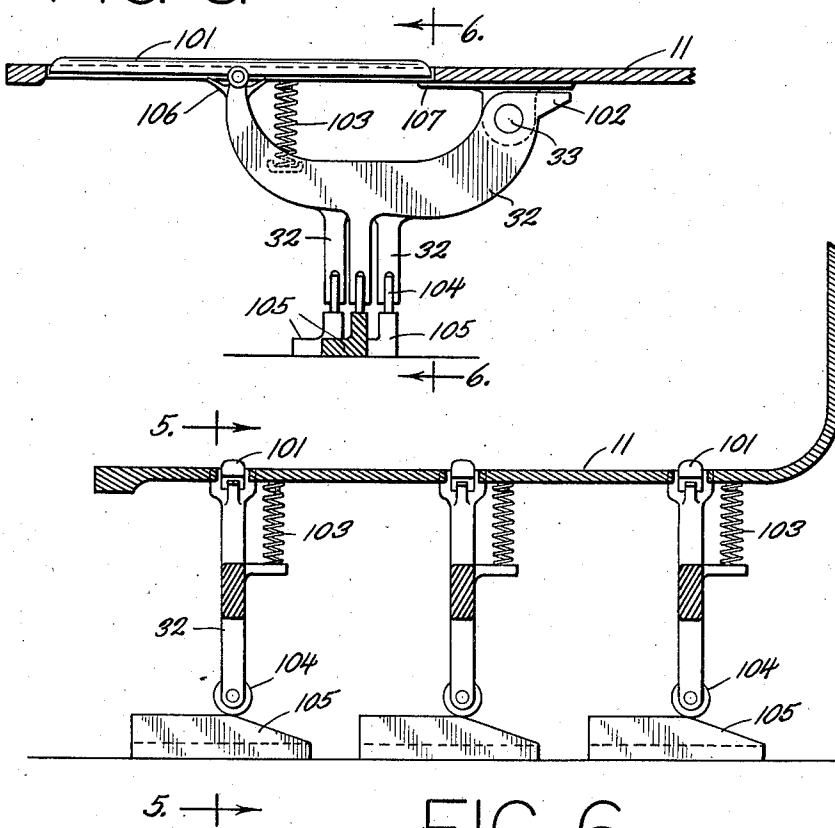


FIG-6.

INVENTOR:

WILHELMUS ADRIANUS VAN BERKEL

BY

Cox & Moore

ATT'YS.

UNITED STATES PATENT OFFICE

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SLICING MACHINE

Wilhelmus Adrianus van Berkel, Clarens, Switzerland, assignor to U. S. Slicing Machine Company, La Porte, Ind., a corporation of Indiana

Application November 5, 1934, Serial No. 751,595
In Great Britain November 9, 1933

11 Claims. (Cl. 146—102)

This invention relates to slicing machines, and particularly to slicing machines employing a gauge plate and a pusher element.

Machines of the type to which the present invention relates have an arrangement to feed the substance against the gauge plate which is arranged slightly beyond but parallel to the cutting plane of the slicing knife, the slicing knife being either mechanically or electrically rotated. Means are employed whereby the substance is fed by a substance engager usually termed a pusher plate and comprising a pusher-and-clamp device. The feeding movement to the pusher is effected either mechanically or automatically. A desirable method of moving the substance against the pusher plate is disclosed in the copending application to Charles Held Serial No. 584,917, filed January 6, 1932.

An important object of the present invention is to provide a slicing machine which is provided with means for lifting or easing the substance from the substance support or carriage so as to eliminate friction caused by the substance against the carriage or substance support, particularly at a time when the substance is directly opposite the gauge plate.

Another object of the invention is to provide means for materially lightening the substance and to lessen the frictional contact between the substance support and the pusher by lifting or easing the substance from the substance support preferably at the beginning of a stroke or at the end of the return stroke and at a time when the substance is directly opposite the gauge plate.

Another object of the invention is the provision of a method for moving the substance intermittently into the cutting plane of the knife and raising the meat or other substance off the substance plate during the intermittent movement.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

The accompanying drawings illustrate a selected embodiment of the invention and the views therein are as follows:

Fig. 1 is a detail perspective view of one type of slicing machine and embodying the invention.

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

Fig. 3 is a detail sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a detail elevational view looking in the direction of the arrows 4—4 of Fig. 3.

Fig. 5 is a detail sectional view of a modified

form of arrangement embodying the invention and looking in the direction of the arrows 5—5 of Fig. 6.

Fig. 6 is a detail elevational view similar to Fig. 4 but taken on the line 6—6 of Fig. 5.

The particular slicing machine herein disclosed, for the purpose of illustrating the present invention, comprises a slicing machine having a stationary base 10 and a substance support 11 which, in the particular embodiment, is a carriage mounted on rails 12 and 13 for fore-and-aft reciprocation. The carriage is adapted to be reciprocated past the cutting edge of the knife, and includes or carries the usual substance or food support which may comprise an integral part of the carriage or it may be a separate or additional member. A slicing knife 14 mounted in a casing 15 is arranged at one side of the base 10 in the usual manner. The knife may be rotated either by an electric motor, or alternately by a mechanical connection with the substance.

A gauge plate 16 is associated with the knife and is arranged slightly beyond and parallel to the cutting plane of the knife. Means, not shown, are provided, for moving the gauge plate 16 inwardly and outwardly according to the thickness of a slice to be cut. The means for operating the gauge plate are well-known and, therefore, further description thereof need not be made. Substance on the substance support 11 may be held or supported by suitable means which may comprise any convenient well-known means, but in the present illustration comprises a substance engager or pusher plate 17. The pusher plate 17 may be of the pusher-and-clamp type, the pusher portion comprising a plate 17' and the clamp portion comprising a bar 17''. The substance engaging surfaces of the member 17 may be each provided with toothed or spiked elements 18. A handle 19 on the arm 20 is operatively connected to the pusher plate 17. The free end of the arm 20 is slidably and turnably mounted on a guide rod 21 which is secured to a part of the substance support 11.

In operating the machine so far described, the operator reciprocates the support 11 from end to end of the base 10, the substance being thus carried to and fro past the exposed edge of the rotating knife. Prior to the cutting of a slice, the substance engager is displaced toward the slicing plane, the substance being thereby fed across the support 11 into engagement with the gauge plate 16.

The means for lifting or easing the substance to eliminate or lessen frictional contact between

the substance and the substance support during the feed movements comprises a series of openings 30 which are formed in the substance support 11 a short distance from the end thereof adjacent the slicing plane, Fig. 1. A series of rollers 31 are arranged in register with the holes 30, there being one roller in each hole. The rollers 31 are carried at the free ends of a corresponding series of arms 32, Figs. 2 to 4, all the arms 32 being pivotally mounted on a shaft 33 which is rigidly fixed on the underside of the support 11. The arms 32 are individually pulled upward by springs 34, the upward limit of the movement of the arms being defined by a displaceable abutment bar 35. The rollers 31 are urged by the spring action to extend through the openings 30 as far as permitted by the abutment bar 35.

The bar 35 has its ends provided with rods 36, Fig. 3, which are respectively guided in brackets 37 secured to the underside of the support 11. The ends 36 of the bar 37 are continuously pressed downwardly by springs 38. The total thrust of the two springs 38 is greater than the total thrust of the several springs 34. Thus, the springs 38 tend to force the bar 35 downward into its lowest position. Stops 39 are provided on the guide rods 36' and are arranged in slots 40, Fig. 3, formed in the brackets 37. Rollers 41 and 42, which are arranged on the ends 36 of the bar 35, are adapted to cooperate with cam members 43 and 44 which may be adjustably secured to the base 10, if desired. The roller 41 and the member 43 are offset from the roller 42 and member 44, Fig. 4, so that the roller 41 and its mounting will not follow the member 44 during reciprocatory movement of the substance support 11. The construction and arrangement of the parts is such that during the slicing operation, the rollers 41 and 42 are clear of their cam members 43 and 44 with the result that the abutment bar 35 occupies its lowest position. When the abutment bar 35 is in its lowest position, it will hold the arms 32 depressed to such an extent that the rollers 31 will be beyond the substance supporting surface of the support 11, thereby rendering the rollers 31 inoperative when in such depressed position. During the return movement of the substance support 11, the rollers 41 and 42 will engage their respective cams 43 and 44 when the substance support moves to a position to register with the gauge plate 16. The action of the cams 43 and 44 forces the bar 35 upwardly in opposition to the pressure of the springs 38. Therefore, the arms 32 will be subjected to the upward pull of the springs 34 with the result that the rollers 31 will be pulled upwardly and extend a predetermined distance above the upper face of the substance support and into engagement with the substance. The springs 34 are of such a strength that all the rollers 31 will lift the substance free from contact with the substance support at the edge of the substance support lying adjacent the gauge plate. The individual springs 34 operate the individual rollers 31, whereby proper adjustment can be had and proper lifting arrangement enhanced regardless of the irregularity in the shape of the substance.

As shown in the drawings, the substance support is in the position approaching the end of its return stroke. When in such position, the rollers 41 and 42 have almost reached the summit of the cams 43 and 44. When the rollers 41 and 42 reach their top or uppermost position, the substance will be subjected to the full upward thrust of the roller 31. When in this upward position,

it is desirable that the feed movement should be imparted to the substance by means of the substance engager 17. The rollers 31 then lift or ease the substance in such a manner that the frictional contact between the substance support 11, during the feed or pushing movement, will be wholly or partly avoided. The work of feeding the substance toward the gauge plate is therefore materially lessened.

Shortly after the commencement of the next slicing stroke, the rollers 41 and 42 will move down their cams, at which time the springs 38 will return the abutment bar 35 into its lowest position. This movement of the bar 35 will cause the rollers 31 to withdraw or recede below the level of the substance supporting surface of the support 11. The substance will then again be in full frictional contact with the substance support during the slicing operation, so that movement of the substance during the slicing operation will be frictionally resisted.

Another way of lifting or easing the substance out of frictional contact with the substance support is shown in Figs. 5 and 6 wherein long supports 101 may be substituted for the rollers 31. The right hand side of each lever 32 is provided with a stop nose 102 which becomes effective when the support 101 has been retracted below the general supporting surface by the action of a compression spring 103. Each lever 32 is provided with a roller 104 which cooperates and engages with individual cams 105.

In Figs. 5 and 6 there are shown three cams cooperating with the three levers 32 therein shown. If additional levers are to be used, of course additional cams must be employed. The cams 105 are successively distributed under the levers, each cam 105 positively moving a support 101 above the supporting surface, while the spring 103 causes retraction of each individual support 101.

The modified arrangement shown in Figs. 5 and 6 may be preferable over the construction shown in Figs. 1 to 4 inasmuch as the cams 105 positively lift the substance, while the spring 34, shown in Figs. 1 to 4, must be strong enough for the heaviest substance used.

It is to be understood that as many members 101 as desired may be used, the three members 101 shown in Fig. 6 being sufficient for the purpose of illustrating the method and mode of operation. Means 106 of any desirable or convenient construction may be employed for operatively securing the members 101 to their respective members 32. Also, a supporting face 107 may be provided for engaging the underside of the supports 101 as clearly disclosed in the drawings, particularly Fig. 5.

The invention comprises simple and novel means for reducing the friction between the substance and the substance support, particularly at a time when the substance is to be pushed or fed toward the gauge plate to cut a subsequent slice, and permits or maintains the usual frictional contact between the substance and the substance support during the cutting operation.

Changes may be made in the form, construction, and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. A slicing machine comprising a substance support, a rotating knife, a gauge plate, means

arranged at spaced intervals in said support for lifting the substance from the support, means for operating the lifting means, and spring means for holding said lifting means depressed within the substance support during the slicing operation of the knife.

2. A slicing machine comprising a substance support, a knife, mechanism whereby substance on the support is sliced by the knife during reciprocation of the substance support across the knife, and means comprising lifting means for lifting the substance from the substance support, means for rendering said lifting means being operative when the substance support reaches a predetermined position, and means for rendering the lifting means inoperative when the substance support is moved out of said predetermined position.

3. A slicing machine comprising a knife and means for operating the knife, a substance support, means to reciprocate the support across the cutting edge of the knife, lifting means operatively associated with the support for freeing the substance from the support each time the support is at a predetermined position, means having operative association with the support for operating the lifting means, and means for rendering said lifting means inoperative when the support is at a position other than the said predetermined position.

4. A slicing machine comprising a knife and means for operating the knife, a substance support, means to reciprocate the support across the cutting edge of the knife, lifting means operatively associated with the support for lifting the substance from the support, cam means having operative association with the support for operating the lifting means each time the support is at a predetermined position, and means for rendering the lifting means inoperative when the lifting means are not operated by the cam means.

5. A slicing machine comprising a knife and means for operating the knife, a substance support, means to reciprocate the support across the cutting edge of the knife, lifting means operatively associated with the support for freeing the substance from the support each time the support is at a predetermined position, means having operative association with the support for operating the lifting means, and spring means for rendering said lifting means inoperative when the support is at a position other than the said predetermined position.

6. A slicing machine comprising a knife and means for operating the knife, a substance support, means to reciprocate the support across the cutting edge of the knife, lifting means extending through the substance support for freeing the substance from the substance support, means having operative association with the support for operating the lifting means, and spring means for rendering said lifting means inoperative during the cutting operation.

7. A slicing machine comprising a knife, means for operating the knife, a carriage, means to re-

ciprocate the carriage across the cutting edge of the knife, a substance support on the carriage, a substance pusher on the substance support to move substance toward the cutting plane of the knife, lifting means operatively associated with the support for freeing the substance from the substance support each time the support is at a predetermined position during operation of the substance pusher, means having operative association with the support for operating the lifting means, and means for rendering said lifting means inoperative during the cutting operation.

8. A slicing machine comprising a knife, means for operating the knife, a carriage, means to reciprocate the carriage across the cutting edge of the knife, a substance support on the carriage, a substance pusher on the substance support to move substance toward the cutting plane of the knife, lifting means extending through the substance support for freeing the substance from the substance support, means having operative association with the support for operating the lifting means, and spring means for rendering said lifting means inoperative during the cutting operation.

9. A slicing machine comprising a knife and means for operating the knife, a substance support, means to reciprocate the support across the cutting edge of the knife, a gauge plate associated with the knife, lifting means operatively associated with the support for freeing the substance from the support each time the support is at a position opposite the gauge plate, means having operative association with the support for operating the lifting means, and means for rendering the lifting means inoperative when the support is not in said position.

10. A slicing machine comprising a knife and means for operating the knife, a substance support, means to reciprocate the support across the cutting edge of the knife, a gauge plate associated with the knife, lifting means extending through the substance support for freeing the substance from the support each time the support is at a position opposite the gauge plate, means having operative association with the support for operating the lifting means, and means for rendering the lifting means inoperative when the support is in positions other than said position.

11. A slicing machine comprising a knife and means for operating the knife, a substance support, means to reciprocate the support across the cutting edge of the knife, a gauge plate associated with the knife, lifting means extending through the substance support for freeing the substance from the support each time the support is at a position opposite the gauge plate, means having operative association with the support for operating the lifting means, and spring means for rendering the lifting means inoperative when the support is in positions other than said position.