

United States Patent

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3,107,709 10/1963 Garapolo et al. 146/95
 3,178,974 4/1965 Roess 83/318X
 3,338,283 8/1967 Harms et al. 146/95

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[54] **SLICING MACHINE**
3 Claims, 7 Drawing Figs.

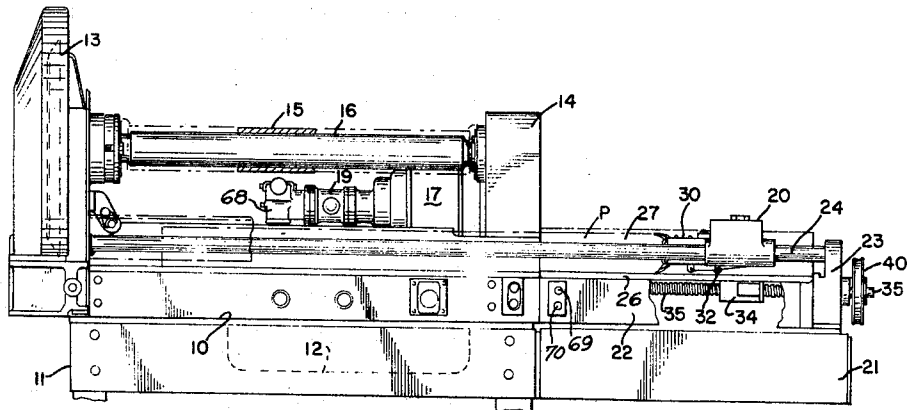
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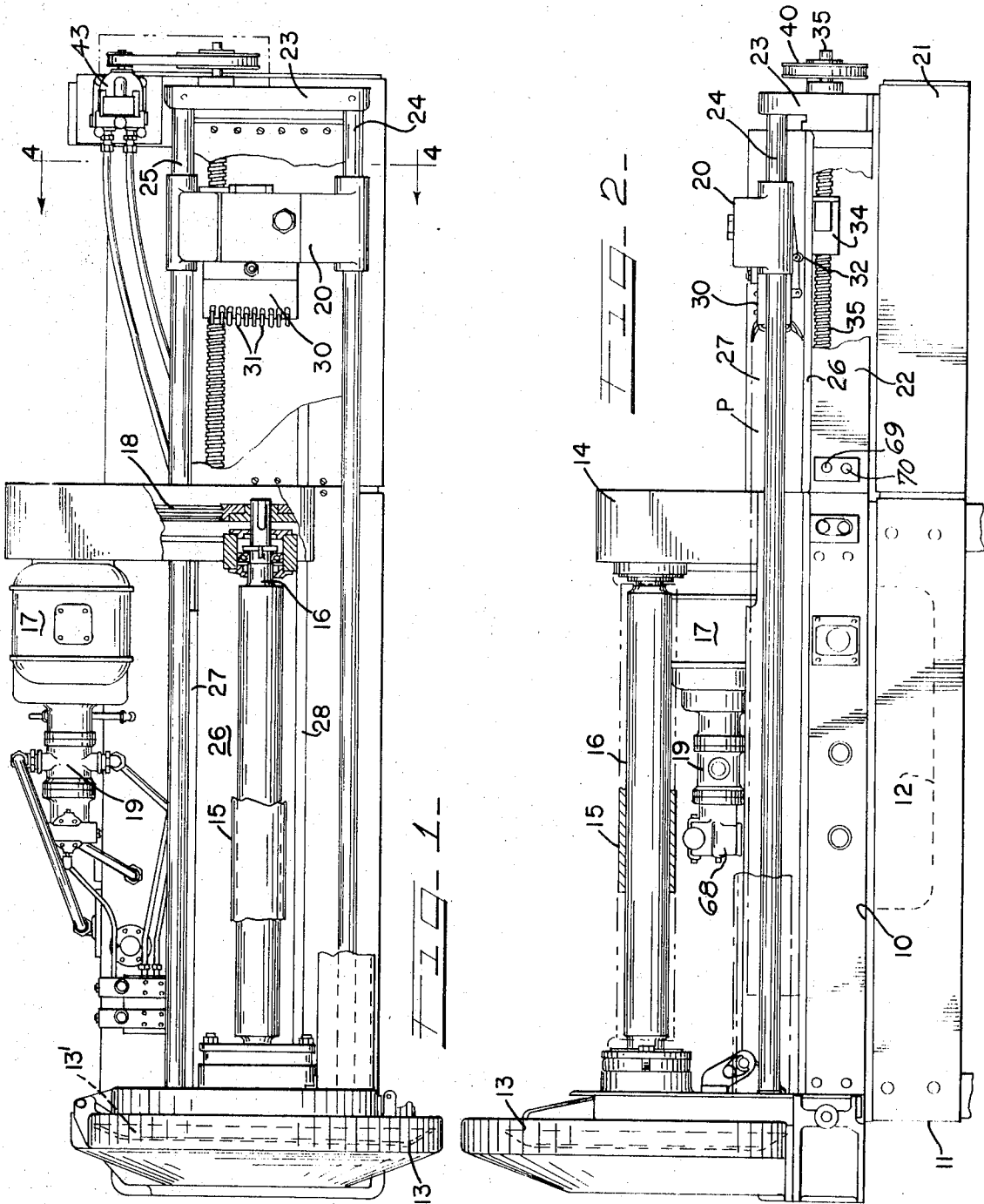
[51] Int. Cl. **A22c 17/02**

[50] Field of Search 146/95, 94,
 113, 102.9; 83/318, 448; 143/132.2

[56] **References Cited**
UNITED STATES PATENTS
 103,347 5/1870 Lepp 148/132.2
 1,976,823 10/1934 Mahler 146/113X

ABSTRACT: A slicing machine particularly adapted for large size bologna and similar products which may have greater than the normal length, the machine comprising a rotatably driven slicing knife disposed at the end of an elongate table on which the product is advanced by a reciprocably mounted pusher which carries a means to grip the trailing end of the product and which is reciprocated by connection with a screw which is rotated by a fluid motor forming part of a hydraulic control system and having proximity switches spaced along the path of the pusher which switches are actuated by the pusher and which switches open and close valves in the hydraulic system for effecting advance and return movement of the pusher.





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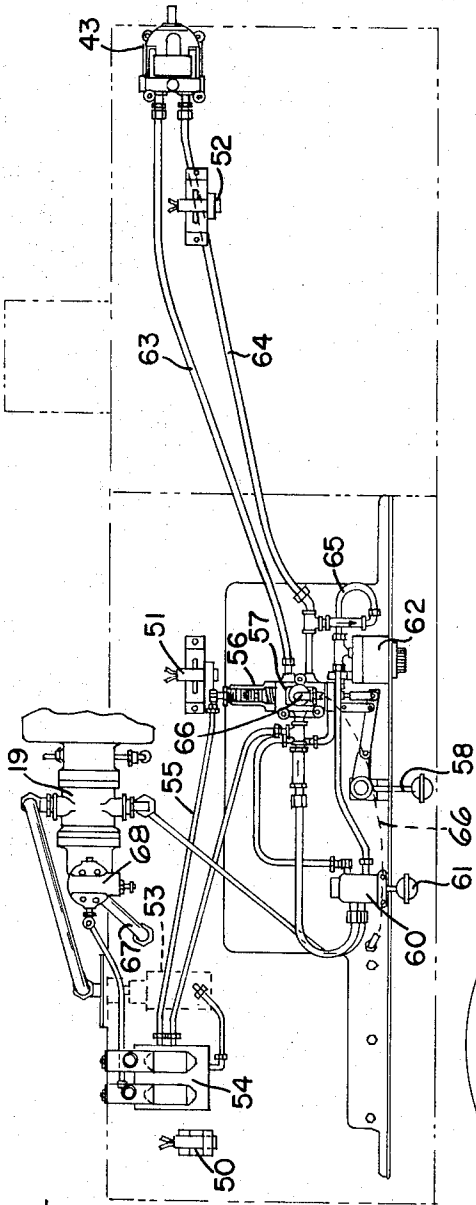


Fig. 5-

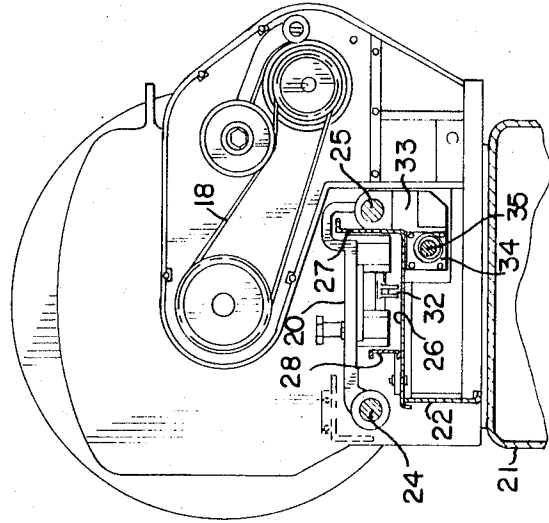


Fig. 4-

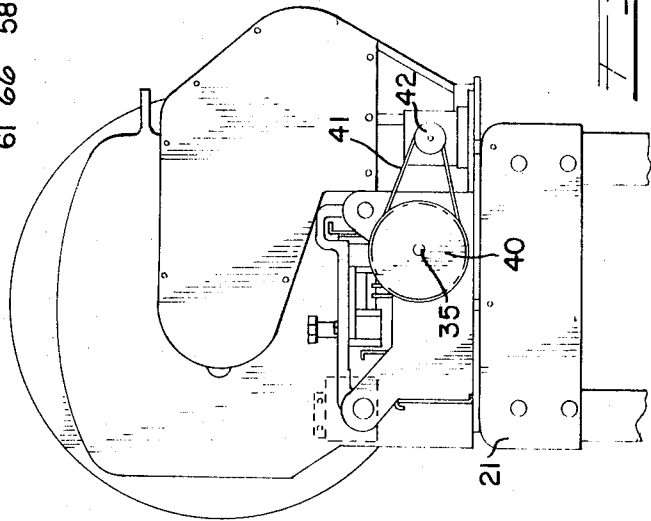


Fig. 3-

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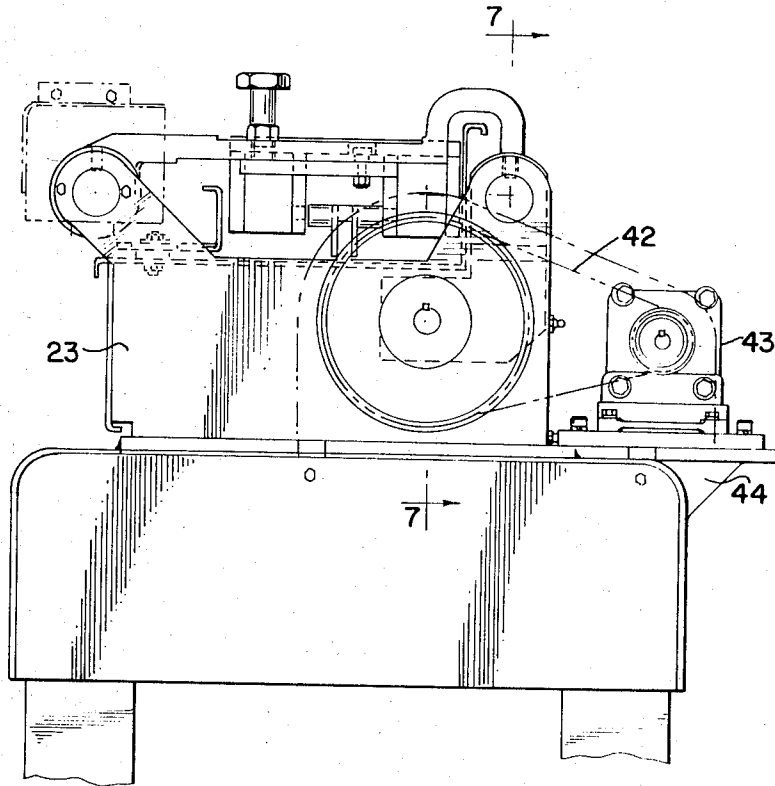
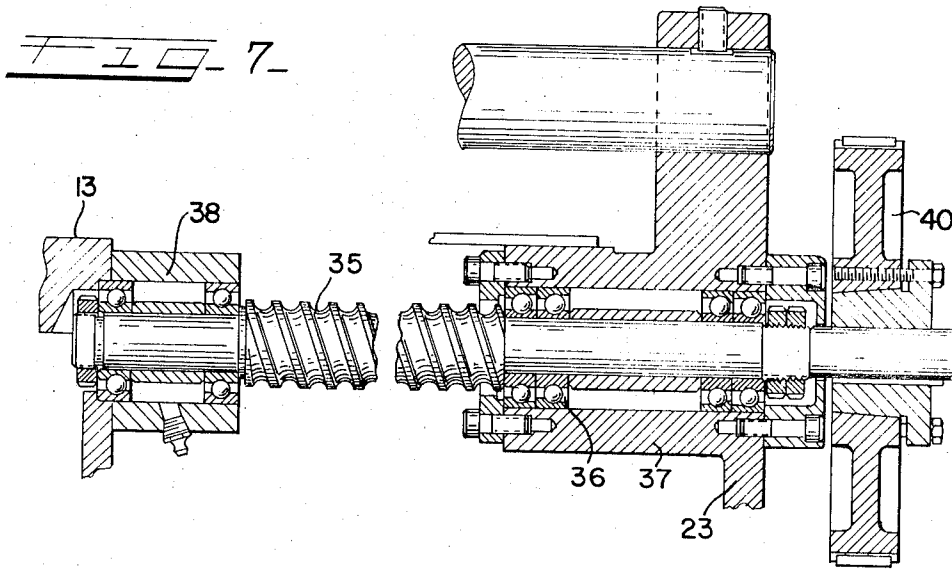


FIG. 6

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SLICING MACHINE

This invention relates to slicing machines and is more particularly concerned with improvements in machines of the type which are adapted for slicing food products, such as, slabs of bacon, bologna and similar products which are generally processed in slab or loaf form and sliced prior to packaging for distribution.

Various machines have been produced for slicing food products, such as, slabs of bacon, lengths of bologna, blocks of cheese and similar products. One such machine which is available commercially is produced by the Albright Nell Company, Chicago, Illinois, and is identified as "Anco No. 827 Bacon Slicer," the machine being designed especially for slicing bacon or other products of similar size and nature. This machine is provided with a table on which a reciprocating pusher in the form of a carriage is mounted with grippers for engaging the trailing end of the product and with a hydraulic control system for advancing the product to a continuously rotating slicing knife, the carriage being connected for movement to the piston or ram of a hydraulic cylinder projecting from the end of the table on which the carriage is supported. Machines of this type have been found highly satisfactory in handling products such as bacon slabs, large size bologna of conventional length, or the like. In machines of this type the stroke of the carriage is limited by the stroke of the operating piston or ram so that the length of the product which can be handled on the same is definitely limited. In the manufacture of large diameter bologna which is commonly sliced to luncheon meat packages it has been customary to employ casings in the form of plastic tubes or sleeves into which the meat is stuffed and which are of relatively short length, generally in the neighborhood of 36 inches. Recently, it has been found desirable to process sausage products of this type in a casing of longer length, up to as much as 72 inches. The slicing machines heretofore available have not been designed to accommodate products of this length. An effort has been made to modify existing machines in order to accommodate the longer products which has not been successful because the result has been to increase the overall length of the machine to a point which is undesirable economically and for other reasons. It is an object, therefore, of the present invention to provide an improved slicing machine which is capable of handling products, such as large diameter bologna, which have substantially greater length than usually encountered in this type product without increasing to an undesirable degree the overall length of the machine and which provides more accurate control of the product feed.

A more specific object of this invention is to provide a slicing machine which will operate efficiently to slice relatively long lengths of large size sausage and similar products without unduly increasing the overall length of the machine and which has other advantages over machines heretofore available.

It is another object of the invention to provide in a product slicing machine of the character described an improved arrangement for advancing the product along a supporting table to the slicing knife whereby the machine is capable of slicing relatively long lengths of large size sausage and similar products in an efficient manner.

It is a further object of the invention to provide a product slicing machine of the type described wherein the product supporting bed is extended beyond the normal length and provided with a product gripping carriage which is reciprocated by operation of a screw feed driven by an hydraulic motor with a valve control system which enables the path of the carriage to be adjusted so as to accommodate products of substantially different lengths.

These and other objects and advantages of the invention will be apparent from a consideration of the slicing machine which is shown by way of illustration in the accompanying drawings wherein:

FIG. 1 is a plan view of a slicing machine which incorporates therein the principle features of the invention, with portions of the machine being broken away;

FIG. 2 is a side elevation of the slicing machine of FIG. 1 with portions thereof broken away;

FIG. 3 is an end elevation showing the infeed end of the machine;

FIG. 4 is a cross section taken on the line 4-4 of FIG. 1;

FIG. 5 IS A DIAGRAMMATIC VIEW SHOWING THE HYDRAULIC CONTROL SYSTEM FOR THE machine;

FIG. 6 is an end elevation showing a portion of FIG. 3 to a larger scale; and

FIG. 7 is a fragmentary vertical section taken on the line 7-7 of FIG. 6 to a larger scale.

For the purpose of illustration, the invention is shown in the drawings as incorporated in the commercially available Anco Co. 827 Bacon Slider referred to above, which machine is designed basically for slicing bacon in slab form. The construction of the basic machine is well known and only those elements which have been modified or added and which are necessary for an understanding of the present invention will be described in detail.

The slicer FIGS. 1 to 5) is mounted on the table forming top 10 of an upright base 11. The base portion 11 has an oil sump or tank 12 as a part thereof, an upstanding knife housing 13 at one end thereof and a drive housing 14 at the other end with a guard 15 for a connecting drive shaft 16, the latter extending between the two ends in spaced relation above the base 11. The cutting or slicing knife 13' FIGS. 1 and 2) is driven by a motor 17 having a belt and pulley connection, indicated at 18, with the knife shaft 16. The motor 17 also drives a pump 19 which forms part of a hydraulic system for controlling the operation of the reciprocating feed carriage 20.

The base 11 has an extension 21 at the infeed end of the machine which supports an upright bracket 23 at the outer end thereof providing a support for one end of a pair of laterally spaced guide rods 24 and 25, the other ends of which are supported on the knife housing 13 so as to provide a track for the product pusher forming carriage 20.

The product to be sliced, which is indicated at P in FIG. 2, is supported on a guideway forming plate member having a horizontally disposed table forming portion 26 and a vertically disposed side flange portion 27 both of which extend longitudinally of the machine. A longitudinally extending outer channel member 28 forms with the table portion 26 and the flange portion 27 a supporting trackway for the product P which is advanced along the same by movement of the carriage 20, the latter being supported on the guide rails 24 and 25. The carriage 20 is provided with a frame 30 at its leading side having product gripping fingers 31 with associated mechanism (not shown) for swinging the fingers 31 into and out of gripping engagement with the trailing end of the product P. The carriage 20 has a bearing roller 32 on its bottom face which rides on the top surface of the guide plate 26. A nut carrying bracket 33 depends at one side of the carriage 20 and has a nut formation 34 on the bottom end which is in threaded engagement with a screw 35 journaled at 36 in a bearing forming portion 37 of the upright bracket 23 and supported at its other end in a bearing bracket 38 beneath and part of the knife housing 13. The screw 35 is extended beyond the upright bracket 23 and carries a pulley 40 which is connected by belt 41 with the output pulley 42 on hydraulic motor 43 which is supported on a bracket 44 at the end of the frame extension 21. The motor 43 is operated through the hydraulic system which is hereinafter described. The screw and nut connection results in low friction and is more responsive to small changes of the flow control valve hereinafter referred to.

The control system for moving the carriage 20 in a reciprocating path toward and from the slicing knife or blade 13' includes three proximity switches 50, 51 and 52 which are spaced along the path of the carriage 20 and triggered by movement of the same. The switch 50 is located adjacent the knife housing 13 and is triggered by the carriage 20 when it reaches a predetermined point relative to the blade 13' to reverse the movement of the same and return the carriage to a position to receive a new product to be cut. The switch 51 is located at a point to stop the carriage at an intermediate position for adapting the machine for slicing products of short length. The switch 52 is positioned at the far end of the path of

the carriage so as to stop the carriage in proper position for slicing long lengths of products. The hydraulic system includes the fluid supply or pressure pump 19 which sucks or receives fluid through a filter 53 to the pump. The pump then delivers fluid at pressure to solenoid operated valves 54 which are controlled by the proximity switches 50, 51 and 52 operating through a suitable electrical circuit and to two-way valve 60. Fluid line 55 leads to the pilot cylinder 56 on the four-way valve 57, the latter being controlled by the pilot cylinder 56 and also by a hand lever 58. The hand lever 58 is employed when rapid shifting of the feed carriage is desired during either forward or rearward movement thereof. The two-way valve 60 with a manual on-and-off lever 61 controls the flow of pressure fluid to the four-way valve 57. A carriage speed control device at 62 has a manual adjustment for controlling the rate of fluid flow through the hydraulic motor 43 which drives the feed screw 35. The four-way valve 57 is connected by the fluid line 63 to the hydraulic motor 43 to deliver fluid for advancing the carriage 20. Fluid line 64 connects the valve 57 with the hydraulic motor 43 for delivering fluid for return of the carriage 20 to its retracted position. Return of the fluid from motor 43 during product feeding or advance of the carriage 20 is through line 64 and line 65 and through the speed control device 62 and to oil sump or tank 12. During return or retracting movement of the carriage 20 the fluid return flows through line 63 direct to four-way valve 57. The four-way valve has a line 66 connecting with the fluid supply tank 12. Excess oil from pump 19 is connected to the supply tank 12 through line 67, and an integral relief valve 68.

The operation of the machine will be obvious from the above description. The proximity switches 50, 51 and 52 are set at the proper position for the length of the product to be sliced and the movement of the pusher forming carriage 20 is automatic when push button 69 (FIG. 2) is pressed. Selection of long or short cycle is selected by switch 70, and by moving a cam of associated mechanism (not shown). Manual stop is available through on-and-off control lever 61. Rapid movement is available with lever 58. Manual adjustment is available with speed control device 62.

While particular materials and specific details of construction are referred to in describing the form of the invention illustrated in the drawings, it will be understood that other suitable materials and equivalent structural details may be resorted to within the spirit of the invention.

I claim:

1. In a slicing machine for meat and similar products having a slicing blade mounted on one end of a rotatable supporting shaft, an elongate product supporting table portion, said blade supporting shaft being mounted at opposite ends on the opposite ends of said table portion, an extension on the end of said table portion which is remote from said slicing blade and a reciprocating carriage for feeding a product to be sliced along said table extension and the table portion to the blade,

guide means for said carriage extending the length of said table portion and said table extension, means on said carriage adapted for engaging the trailing end of said product, a rotatable drive means extending along the length of said table portion and said extension, which drive means has a connection with said carriage for reciprocating said carriage, plural electrical sensing means spaced along said table and the table extension, which are actuated in response to movement of said carriage between a fully retracted position or a partially retracted position and a position adjacent said slicing blade, one of which sensing means is selectively energized, a hydraulic system having control valves actuated by said electrical sensing means, and said hydraulic system including a hydraulic motor connected in driving relation with said rotatable drive means so as to advance said carriage for slicing a product held by said product engaging means and to return said carriage to a retracted or a partially retracted position according to the actuation of said preselected sensing means for repeating the cycle of operation.

2. In a slicing machine as set forth in claim 1, and said rotatable drive means for reciprocating said carriage comprising a rotatable screw member extending parallel with the path of said carriage and a nut mounted on said screw member and connecting said carriage with said screw member.

3. In a slicing machine for meat and similar products, said machine having a horizontally disposed product supporting table, a slicing blade mounted on the end of a rotatable supporting shaft disposed above said table, said table having an extension at the infeed end of the machine for supporting an extra long product, and a carriage mounted for reciprocating movement along the table and said end extension in a path toward and from the blade, guide means for said carriage mounted at one end adjacent said slicing blade and at the other end on said table extension, grippers on said carriage for engaging the trailing end of said product, means comprising a screw mounted along one side of said table and said end extension and having a traveling nut thereon which is connected with said carriage with reciprocating said carriage, a plurality of proximity switches mounted in spaced relation along the path of said carriage which are actuated by movement of said carriage past the same, one of said proximity switches being at each end of said carriage guide means and a third proximity switch being intermediate said aforementioned proximity switches and said proximity switches which are remote from said slicing blade being selectively energized, a hydraulic system having control valves actuated by operation of said proximity switches, said hydraulic system including motor drive means connected to said screw to reciprocate said carriage so as to advance said carriage for slicing a product and to return said carriage to a fully retracted or a partially retracted position according to actuation of said control valves by said preselected proximity switches for repeating the cycle of operation.

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