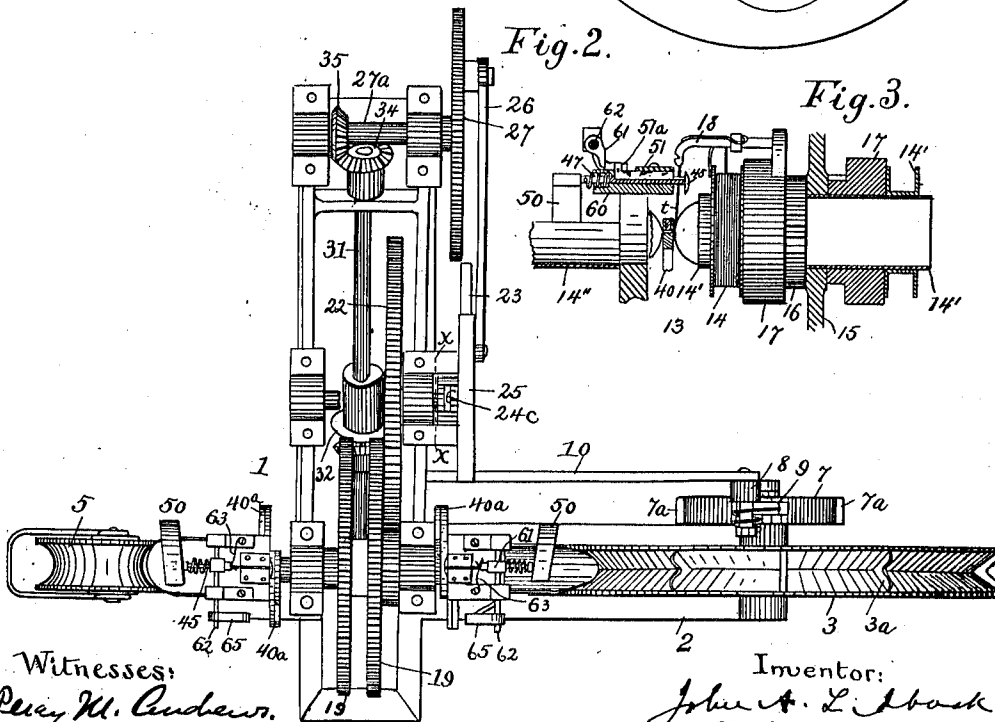
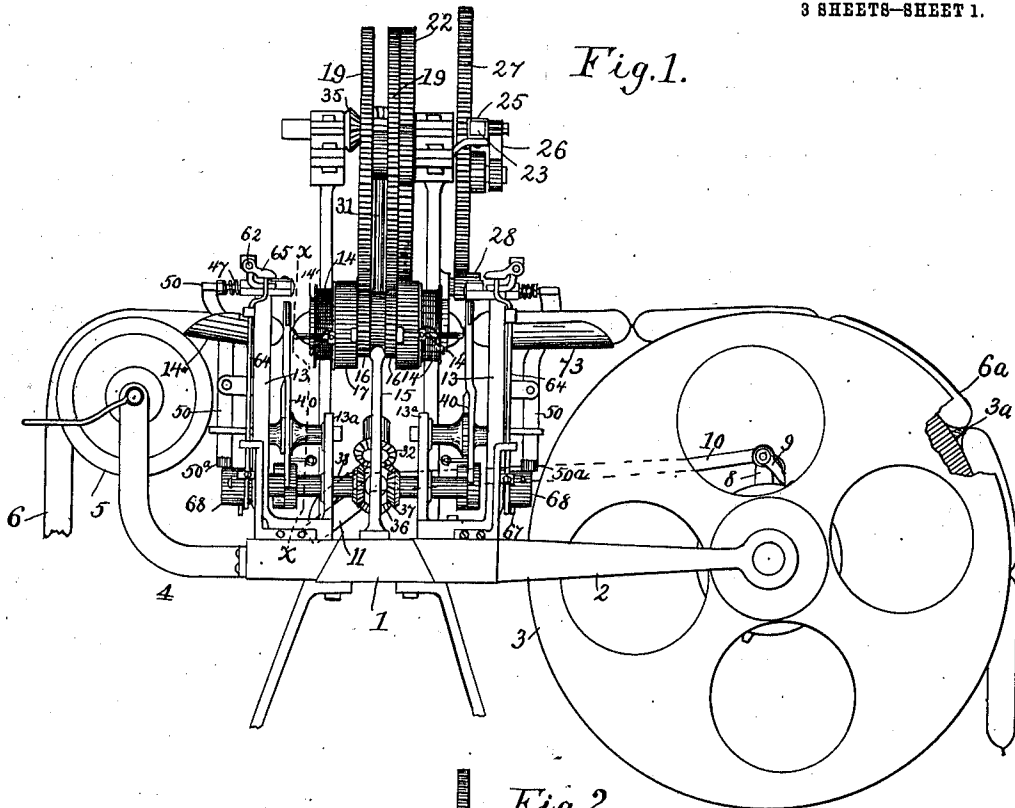


J. A. LIDBACK.
SAUSAGE LINKING MACHINE.
APPLICATION FILED NOV. 5, 1910.

1,004,580.

Patented Oct. 3, 1911.

3 SHEETS—SHEET 1.

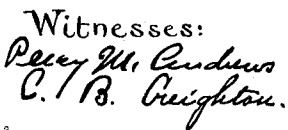


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Inventor:
John A. Lidback
by S. W. Bates atty.

1,004,580.

3 SHEETS—SHEET 2.



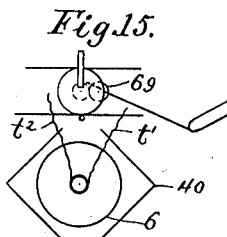
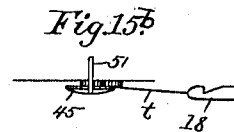
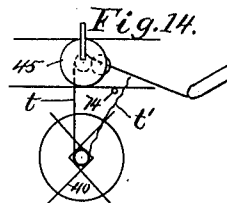
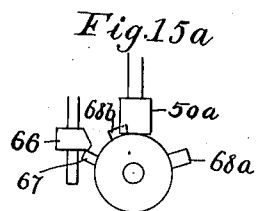
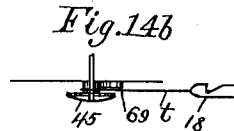
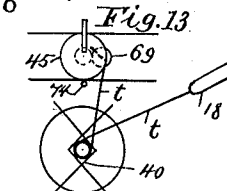
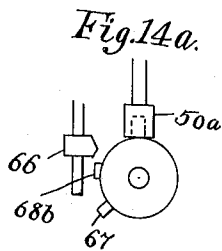
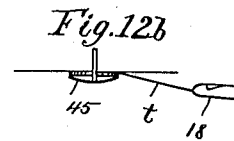
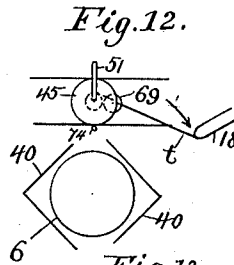
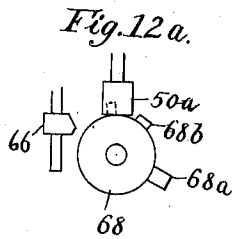
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SAUSAGE LINKING MACHINE.
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN A. LIDBACK, OF PORTLAND, MAINE.

SAUSAGE-LINKING MACHINE.

1,004,580.

Specification of Letters Patent.

Patented Oct. 3, 1911.

Application filed November 5, 1910. Serial No. 590,943.

To all whom it may concern:

Be it known that I, JOHN A. LIDBACK, of Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Sausage-Linking Machines, of which the following is a specification.

My invention relates to a machine for linking sausages.

Hitherto it has been the common practice to divide sausages into links or sections after the case was stuffed by twisting the joints by hand. This was done by seizing the case each side of the section to be operated and by a whirling motion rotating it in one direction or the other. The result was a twisting of the membrane at each end of the section whereby a link was formed. The defect of this method of linking was that when the sausages were hung up to be smoked they would become untwisted, causing the sections to run together.

The object of my invention is to form the sausage into links by wrapping around the joints several turns of thread or fine cord and cutting the ends of the thread so that the thread at each joint will be entirely separate from that of the other joints. This I accomplish by means of my present invention which consists essentially of a winding device by which thread is wrapped around the joint a plurality of turns, the ends of the thread being cut by a suitable knife, the end connected with the sausage being released and the end connected with the bobbin or other winding means being retained for the next joint.

The sausage is thus separated into links by joints wound closely with several turns of thread and the ends of the thread being free or detached from the main body of the thread.

I illustrate my invention by means of the accompanying drawing in which is shown a machine embodying the several features of my invention although I desire it to be understood that many variations and modifications may be made without departing from the spirit of the invention.

In the drawing: Figure 1. is a side view of my linking machine, Fig. 2. is a plan of the same, Fig. 3. is part longitudinal section and part elevation through the feeding

tube and its adjacent parts, Fig. 4. is an end elevation with the upper portion of the feeding wheel cut away to show the linking mechanism, Fig. 5. is an enlarged section on the line X X of Fig. 1. Fig. 6. is a horizontal section on the line X X of Fig. 5. Fig. 7. is a detail of the spindle and the thread cutting knife, Fig. 8. is a view of the under side of the thread clamping head showing the thread clearer, Fig. 9. is an end view of the cam which operates the thread clamping and cutting mechanism, Fig. 10. is a plan of the same, Fig. 11. is a detail section on the line X X of Fig. 2, showing the ratchet connection which actuates the winding mechanism, Figs. 12, 13, 14, and 15 are diagrams illustrating the different positions of the winding and thread clamping and cutting mechanism, Figs. 12^a, 14^a, and 15^a. are diagrams of the actuating cam showing positions corresponding with the positions of the clamping and cutting parts as shown in Figs. 12, 14 and 15 respectively, and Figs. 12^b, 14^b and 15^b are plan views corresponding to Figs. 12, 14 and 15 respectively.

In the drawing 1 represents the bed piece which is supported by legs and which carries by means of suitable standards the working parts of the machine.

The sausage 6 in form of a filled membrane is fed through the machine passing over a suitable guide roll 5 journaled on arms 4 attached to the bed piece. The sausage is drawn through the machine by means of a grooved feeding wheel 3 journaled on the ends of the arms 2 secured to the machine. The periphery of the wheel 3 is grooved to fit the sausage and the groove is provided with transverse partitions 3^a designed to fit around the dividing joints of the individual sausages 6^a after they have been linked and passed through the machine. The sausage is fed or drawn through the machine by the intermittent rotation of the wheel 3 and this intermittent motion is secured as here shown by means of a pawl and ratchet mechanism.

As shown, the wheel 3 has connected with it on the same arbor a ratchet wheel 7 with four ratchet teeth 7^a. An arm 8 is pivoted to the wheel shaft and on this arm 8 is a spring pawl 9 adapted to engage the teeth

7^a. The pawl and arm are reciprocated by a pitman 10 connected with a crank 11 (Fig. 1) on the main shaft 12. (Fig. 4.) The rotation of the main shaft and the crank are so timed that the wheel 3 will remain stationary while the joints are being wrapped with thread as hereinafter shown and will feed forward after the joints are formed.

In the machine as here shown the stuffed membrane is contracted at two points at the same time and wound with thread to form joints and links, the two points being just the length of one sausage apart. Thus two links or sections are formed at each operation of the machine, the winding and cutting mechanism being doubled for this purpose.

In entering the machine the sausage passes through a guide or spout 14" and thence through an opening in the upper part of the standard 13 to a horizontal central tube 14' which is fixed to a standard 15 secured to the base of the machine. Means are provided for contracting the sausage to form joints and to wind these joints with thread which is cut free after winding.

As here shown, the winding mechanism is rotated about the tube 14' the latter acting as an arbor or axis of rotation. In the present instance a gear 16 is journaled on the tube, one on each side of the standard 15 and connecting with the gear is a collar 17 carrying a traveler or thread guide 18 and a bobbin 14 is slipped on the end of the tube and supplies thread for winding the joints. The rotation of the gears 16 is effected by the gears 19 on the shaft 20 and located on the same shaft is a small gear or pinion 21 engaging a driving gear 22 which is intermittently rotated by a rack 23 reciprocating over a pinion 24 on the shaft 24^a. As here shown, the rack is held in a guide 25 in which it slides longitudinally and it is reciprocated by a pitman 26 connected with a gear 27 driven by a pinion 28 on the main driving shaft 29. A suitable driving pulley 30 is shown as operating the shaft 29. The pinion 24 is connected with its shaft 24^a by a ratchet wheel 24^b which is fixed to the shaft, the ratchet wheel having a spring pawl 24^c which catches and turns the shaft only when the rack 23 and pitman 26 are moving toward the front of the machine. Thus it will be seen that the traveler and the bobbin which form the winding mechanism are rotated only approximately one half of the time while the sausage feeding mechanism is operated approximately although somewhat less than one half the time. The rotation of the shaft 12 which governs the movement of the feed wheel 3 and the rotation of the gear 27 are so adjusted that each will operate its connecting parts intermittently about one half the time.

65 Motion is conveyed to the shaft 12 through

an inclined shaft 31 having on its lower end a bevel gear 32 engaging a gear 33 on the shaft 12 and having on its upper end a gear 34 engaging a gear 35 on the shaft 27^a.

In order to properly wind the joint it is desirable to compress or contract the section where the joint is to be formed and hold it compressed while the joint is being wound. For this purpose, I provide a gripping device which seizes the sausage at the desired point and compresses it to a small size in such position that it may be wound by the winding mechanism.

As here shown, I make use of a pair of grippers 40 which are pivoted to the standards 13 and 13^a. The lower ends of the grippers have arms 40^a which extend inward and act against cams 42 on the shaft 38. This shaft 38 has a bevel gear 37 which engages a bevel gear 36 on the shaft 12. (Fig. 1.) As here shown, the arms 40^a are drawn against the cams by a connecting spring 43 and the action of the cams is first to close the interlocking jaws of the grippers around the sausage holding them in that position while the joint is wound and then to expand and release the sausage while it feeds through to a new position.

The jaws of the grippers open wide enough to embrace the sausage and they fold together so as to reduce the sausage down to a small cross section.

The joint is wound by the thread of the bobbin which extending through the traveler in the well known manner is led thence to the joint to be wound. In order to wind the joint and cut the thread each time, I provide a thread clamp for holding the end of the thread while the joint is being wound with means for catching the thread in the clamp during its final turn and for cutting it and releasing one portion to go with the sausage as it feeds through and retaining the other portion to form the next joint. As here shown, this thread clamping device is carried in a clamping head secured on the upper end of the standard 13. The thread is caught and clamped by a projection on the end of a spindle on the clamping head and which normally clamps the thread against the clamping head, the spindle being so arranged as to intersect the thread in its path about the joint after the desired number of turns has been made.

As here shown, the spindle 44 is mounted in the clamping head 60 substantially parallel with the sausage and somewhat above the same as the sausage feeds through the opening beneath the head. As here shown, the projection for catching the thread is made in the form of a flat disk 45 formed on the inner end of the spindle and being adapted to be held normally against the face of the clamping head for firmly holding the thread.

The disk is normally adjacent to the path or plane in which the thread revolves around the joint as it comes from the end of the traveler and means are provided from causing the spindle and thread to intersect after the desired number of turns has been made to catch the thread on the last turn.

As shown, the spindle 44 is provided with means as a lever 50 for sliding the spindle forward so that the disk 45 will pass through the plane of the thread and cause the latter to lie across the spindle in rear of the disk. A spring 47 is provided to hold the spindle normally in so that the disk will impinge on the face of the head 60. Thus when the spindle is forced inward by the lever 50 and released, the disk will spring back against the face of the head bringing with it the caught thread. Means are provided for cutting the thread while it is held in a clamped position.

As here shown, I make use of a knife or cutter as 51 which slides in a groove 49 in the head 60 and in a longitudinal slot in the spindle 44. A cutting slot 46 is formed in the disk 45 and the cutting end of the knife is adapted to pass through this slot 46 with a close fit, the slot 46 being continuous with the groove 49 in the spindle. The knife is made to slide forward in its groove to do the cutting by an arm 61 fixed to a shaft 62 which arm strikes against a projection 51^a on the rear end of the knife. The knife is retracted by a spring 63. (See Fig. 2.) Connected with the shaft 62 is an arm 65 acted upon by a vertically movable rod 64 having on its lower end a stop 66 adapted to be struck by a projection 67 on the cam 68. Thus when the projection 67 strikes the stop 66 the knife is forced forward through the slot 46 and the thread is cut.

Means are provided to hold one portion of the cut thread to form a connection for a new turn and to release the other portion to allow it to pass along with the sausage after the joint has been wound. I accomplish this important result as here shown by means of an auxiliary thread clamping bolt 69 slidably mounted in a recess alongside of the recess which holds the spindle. The bolt is pressed normally inward by a spring 70 against the inner face of disk 45 and preferably overlaps the outer edge of the disk. A pin 71 passing through a slot in the bolt limits its motion longitudinally so that it will only follow the disk out a portion of its travel. The adjustments of the parts is such that the traveler will stop in such a position that the thread will be caught by both the disk and the bolt when the spindle is retracted. The bolt is preferably placed at the same level as the spindle 44 and on the side on which the traveler stops so that as the thread falls over the spindle on its last turn it will be caught by the bolt. The

traveler is preferably stopped slightly below the level of the spindle at each revolution of the machine.

As before stated, the spindle 44 is operated to open and close the clamping disk 45 by a lever 50, this lever being pivoted to the rear of the standard 13. On the lower end of the lever 50 is a roll 50^a adapted to be acted upon by the cam projections 68^a and 68^b on the cam roll 68. The projection 68^a is so located as to throw the roll 50^a and the lower end of the lever out to its extreme position forcing the spindle 44 and the disk 45 inward until the latter is beyond the path of the thread. The projection 68^b on the other hand is located to touch the roll 50^a but slightly so as to force the disk 45 to open just far enough to let the cut thread escape from one side. The bolt 69 follows out the disk 45 on the other side and maintaining a bearing all the time so as to retain one side of the cut thread as hereinafter more fully explained.

For the purpose of guiding the sausage from the winding mechanism to the feeding wheel I provide a guide or spout 73 which is secured to the standard 13 and connects with the opening beneath the clamping head 60. When the end of the thread has been clamped tightly between the inner face of the disk 45 and the end of the bolt 69 and the face of the clamping head it is liable to stick in place when the clamping device is opened to release it and to get snarled up with the other turns.

To free the cut end of the thread from the clamp I provide a clearer which is here shown as a wire 74 secured by its rear end to the spindle 44 and terminating at the lower edge of the disk 45. The wire 74 is so held that when it moves forward with the spindle a lateral motion is imparted to it which knocks away the thread from the clamp. As here shown, I bend the wire so as to have an inclined portion which is guided between two pins 75 whereby the outer end of the wire is thrown laterally.

The operation of the winding mechanism can best be understood by reference to the diagrams shown in Figs. 12-15.

In Fig. 12 one end of the thread *t* is shown as caught between the inner surface of the disk 45 and the outer end of the bolt 69 and the face of the head 60. The traveler is at rest in a position somewhat below the level of the spindle 44 so that the thread will draw across the end of the bolt. The grippers are open and the sections which have been tied are being fed through by the motion of the wheel 3. Fig. 12 shows the position of the disk 45.

In Fig. 13 the partial turn of the wheel 3 has been completed and the sausage has been fed along to a position where two new joints are to be wound. The grippers have closed

in and contracted the joint and the bobbin is being rotated by the forward motion of the rack 23 and the several connecting gears, the end of the thread being firmly held while the winding is taking place.

When the desired number of turns have been reached, in the present instance eight, the rack will have reached the end of its stroke and the traveler will stop in the position shown in Figs. 12 and 14. While the last turn is being made the spindle 44 and disk 45 are forced by the lever 50 into the path of the thread and the thread falls over the spindle and is drawn across the end of the bolt 69. The disk meanwhile is forced out beyond the end of the bolt 69 as shown in Fig. 14^b leaving room for the thread to be drawn between the bolt and the inner face of the disk. When the disk and spindle are moving out the clearer 74 knocks the old end *t'* to one side so that it will not become snarled by the new ends.

Having caught the new end and freed the old end the disk is now forced back by its spring, holding the thread in the position shown in Fig. 14. The knife is now forced through the slot 46 by the action of the projection 67 on the stop 66, cutting the thread and immediately thereafter the projection 68^b hits the roll 50^a opening the clamp slightly and allowing the end *t'* which is connected with the sausage to escape and holding to the other end by the action of the auxiliary bolt 69 as shown in Figs. 15 and 15^b. The grippers have opened as soon as the traveler stopped and the sausage is fed along to a new position as explained. The thread as it is wound about the joint becomes saturated with moisture and does not unwind. The sausage is thus fed through the machine, two links being formed at each winding operation. It is evident that instead of having two winding and cutting mechanisms as here shown, a single mechanism may be used or more than two may be used if it is desired to increase the rapid action of the machine.

I have shown and described a machine adapted to linking a single sausage but it is obvious that double sausages may be linked in the same manner as single sausages by providing suitable guides to fit them and winding the thread about both. While I prefer to use thread for forming the joint a flexible cord of any suitable size may be used.

I claim:

1. In a sausage linking machine the combination of a gripping device for contracting the joints between the links, a winding device for winding the joints with a plurality of turns of thread and a thread clamp for holding one end of the thread.

2. In a sausage linking machine the combination of a gripping device for contract-

ing the joints between the links, a bobbin rotating about the sausage, a thread guide connected with said bobbin and a thread clamp for holding one end of the thread.

3. In a sausage linking machine, the combination of a gripping device for contracting the joints between the links, a winding device for winding the joints with a plurality of turns of thread and a cutter for cutting the thread after the joint has been formed.

4. In a sausage linking machine, the combination of a gripping device for contracting the joints between the links, a winding device for winding the joint with a plurality of turns of thread, a cutter for cutting the thread after the joint is wound and a thread clamp for retaining one end of the thread.

5. In a sausage linking machine, the combination of a gripping device for contracting the sausage between the links, a winding device for winding the joint with a plurality of turns of thread, a cutter for cutting the thread after the joint is wound and a thread clamp for retaining one of the cut ends and releasing the other.

6. In a sausage linking machine, the combination of a tube through which the sausage passes, a gripping device for contracting the joints between the links, a bobbin mounted to rotate about said tube, a thread guide connected with the bobbin and a thread clamp for holding the end of the thread.

7. In a sausage linking machine, the combination of a gripping device for contracting the joints between the links, a bobbin, rotating around the sausage, a thread guide connected with the bobbin, a thread clamp for holding one end of the thread and means for causing the thread clamp and thread to engage after a fixed number of turns have been made.

8. In a sausage linking machine, the combination of a gripping device for contracting the joints between the links, a bobbin rotating around the sausage, a thread guide connected with the bobbin, a thread clamp for holding one end of the thread and means for moving the clamp into the path of the thread after the joint has been wound.

9. In a sausage linking machine, the combination of a thread carrying bobbin adapted to rotate around the sausage a plurality of revolutions and a thread clamp for holding one end of the thread.

10. In a sausage linking machine, the combination of a thread carrying bobbin adapted to rotate around the sausage, a thread guide connected with said bobbin, a thread clamp composed of a spindle extending longitudinally of the sausage, a fixed head in which said spindle is mounted, a lateral projection on said spindle adjacent to the path

of the thread, means for moving the spindle longitudinally into the path of the thread to catch the thread and for clamping the same between the projection and the fixed head.

11. In a sausage linking machine, the combination of a tube through which the sausage is drawn, a gripping device adjacent to the end of the tube for contracting the joints between the links, a bobbin mounted on said tube and adapted to rotate thereon, a thread guide connected with said bobbin, a clamping head, a spindle mounted therein longitudinally of the sausage, a disk on the end of said spindle adjacent to the path of the thread, said disk being held normally against the face of the head, means for moving the spindle into the path of the thread after a definite number of turns have been made, to intercept the thread and means for withdrawing the disk to clamp the thread against the face of the head.

12. In a sausage linking machine, the combination of a tube through which the sausage is drawn, a gripping device adjacent to the end of the tube for contracting the joints between the links, a bobbin mounted on said tube and adapted to rotate thereon, a thread guide connected with said bobbin, a clamping head, a spring actuated spindle mounted therein longitudinally of the sausage, a disk on the end of said spindle held normally against the face of the head, means for moving the spindle into the path of the thread after a definite number of turns have been made and for releasing the same to clamp the thread against the face of the head.

13. In a machine for linking sausages the combination of a bobbin adapted to rotate about the joint, a thread guide connected with said bobbin, a clamping head, a spindle mounted in said head longitudinally of the sausage, a slotted disk on the end of the spindle adjacent to the path of the thread, a longitudinally movable knife mounted in said head and adapted to fit in the slot of said disk and means for moving the spindle into the path of the thread and for clamping the thread against the face of the head and means for moving the knife through said slot to cut the thread.

14. In a sausage linking machine, the combination of a gripping device for forming a contracted joint between the links, a winding device for winding thread around said joint, a thread clamping head, a spindle slidably mounted in said head, a slotted disk on the end of said spindle adjacent to the path of the thread and held normally against the face of the thread clamping head, a knife mounted in said head and adapted to fit the slot in said disk, an auxiliary thread clamping bolt slidably mounted in the head and pressed normally against the inner face of the disk, said bolt having a longitudinal

motion less than that of the spindle and means for moving the spindle, knife and bolt longitudinally.

15. In a sausage linking machine, the combination of a gripping device for forming a contracted joint between the links, a winding device for winding thread around said joint, a thread clamping head, a spindle slidably mounted in said head, a slotted disk on the end of said spindle adjacent to the path of the thread and held normally against the face of the thread clamping head, a knife mounted in the head and adapted to fit the slot in the disk, an auxiliary thread clamping bolt mounted in the head having a limited longitudinal motion and adapted to press normally against the inner face of the disk, a spring for pressing said bolt outwardly, and means for moving the spindle and knife longitudinally.

16. In a sausage linking machine, the combination of a thread winding device carrying the thread in a plane or path at right angles to the sausage, a thread clamping head, a spindle slidably mounted therein, a disk on the end of said spindle adjacent to the path of the thread and pressed normally against the face of the head to act as a thread clamp, a continuous slot being formed longitudinally of said spindle and extending through the disk, an auxiliary spring pressed thread clamping bolt slidably mounted in said head with a limited motion and adapted to press normally against the inner face of the disk, a knife mounted and longitudinally movable in said slot and having a cutting edge adapted to pass through the slot in the disk and means for moving the spindle and the knife longitudinally.

17. In a sausage linking machine, the combination of a thread winding device carrying the thread in a plane or path at right angles to the sausage, a thread clamping head, a spindle slidably mounted therein, a disk on the end of the spindle adjacent to the path of the thread and pressed normally against the face of the head to form a thread clamp, a spring pressed auxiliary clamping bolt slidably mounted in the head with a limited longitudinal motion and adapted to press normally against the inner face of the disk, a knife for severing the thread while held by said disk, means for producing the following motions of said parts, namely, sliding the spindle inward to catch the thread at its last turn and to release the old clamped end, retracting the spindle and disk after the new thread is caught to clamp the same, operating the knife to cut the thread while clamped, sliding inward the spindle within the limit of motion of the auxiliary bolt to release the side of the thread connected with the sausage joint while retaining the other side connecting with the winding device.

18. In a sausage linking machine, the combination of a thread winding device carrying thread in a plane or path at right angles to the sausage, a thread clamping head, a head clamp for clamping the thread against the face of said head and a clearer for knocking the thread clear of the clamp when released.

19. In a sausage linking machine, the combination of a tube standard, a tube supported by said standard, a gear journaled on said tube, means for driving said gear, a bobbin connected with said gear and rotated by it, a thread guide connected with said bobbin, a gripping device adjacent to the end of said tube for contracting the sausage to form a joint between the links and a thread clamp for holding one end of the thread during the winding operation.

20. In a sausage linking machine, the combination of a tube standard, a tube supported by said standard, a gear journaled on said tube, means for driving said gear, a bobbin connected with said gear and rotated by it, a thread guide connected with said bobbin, a gripping device adjacent to the end of said tube for contracting the sausage to form a joint between the links and a thread clamp for holding one end of the thread during the winding operation, means for releasing the old end and catching a new portion after a definite number of turns have been made and means for cutting the new portion and releasing the portion connected with the sausage and retaining the portion connected with the bobbin.

21. In a sausage linking machine, the combination of a tube through which the sausage passes, a bobbin rotating about said tube, a thread guide connected with said bobbin, a gripping device for contracting the sausage to form a joint between the links, a thread clamp for holding the thread during the winding operation, releasing on completion of the winding, catching a new portion, a knife for cutting the new portion while it is clamped, means for releasing half of the cut portion and retaining the other half for the next joint and an intermittently operated

feeding wheel for drawing the sausage through when the joint is complete.

22. In a machine for linking sausages of the character described, the combination of a main thread clamp for catching and releasing the thread, a knife for severing the thread while the latter is in a clamped position and an auxiliary clamp cooperating with the main clamp to hold the thread on one side of the knife while the other side is released.

23. In a machine for linking sausages of the character described the combination of a main thread clamp adapted to move when open into the path of the thread to catch the same, a knife for cutting the thread in a clamped position and an auxiliary clamp cooperative with the main clamp to hold the thread on one side of the knife while it is released on the other side.

24. In a sausage linking machine of the character described the combination of a clamp for catching the thread having two clamping surfaces capable of acting independently and a knife between said surface for cutting the thread while in a clamped position.

25. In a machine for linking sausages of the character described the combination of a clamp for catching and holding the thread and a knife for cutting the thread while it is held in clamped position.

26. In a machine for linking sausages of the character described a clamp for catching and holding the thread, a knife for cutting the thread while in a clamped position and a clearer for freeing the clamped thread after the clamp is opened.

27. In a machine for linking sausages of the character described the combination of a thread clamp for catching and clamping the thread and a clearer for forcing the thread from the clamp when released.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN A. LIDBACK.

Witnesses:

S. W. BATES,

PERCY M. ANDREWS.