

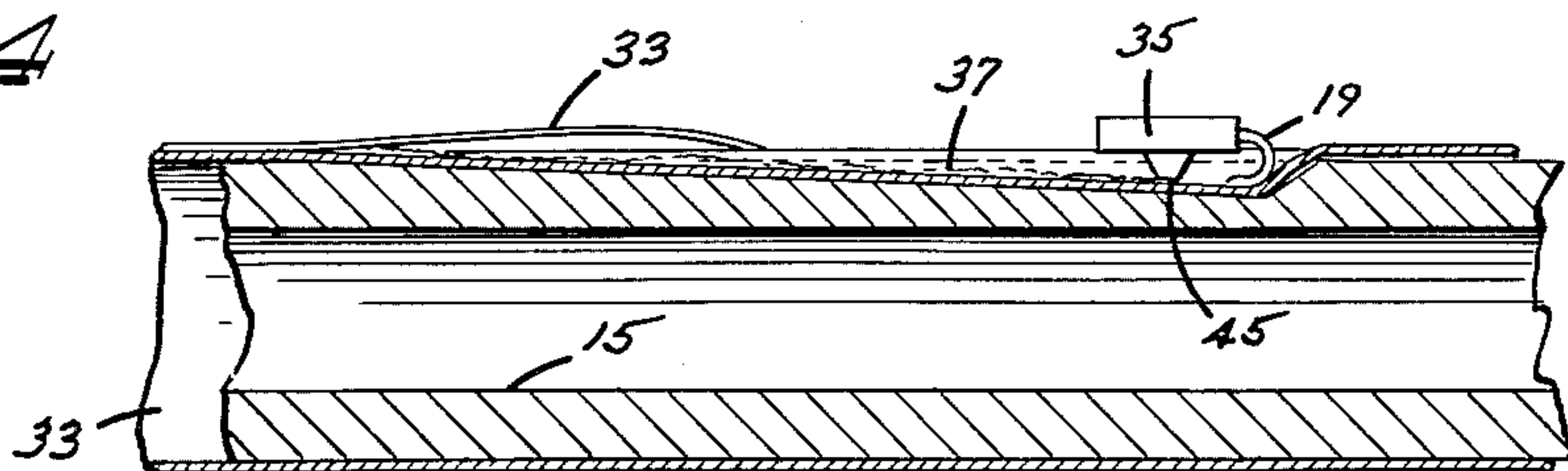
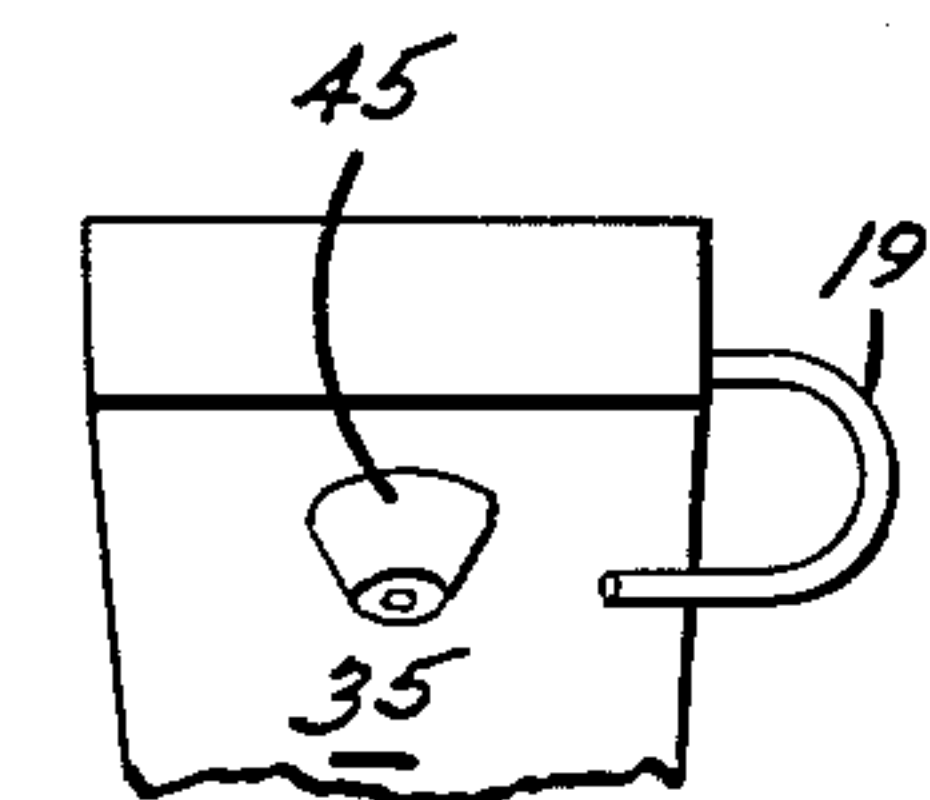
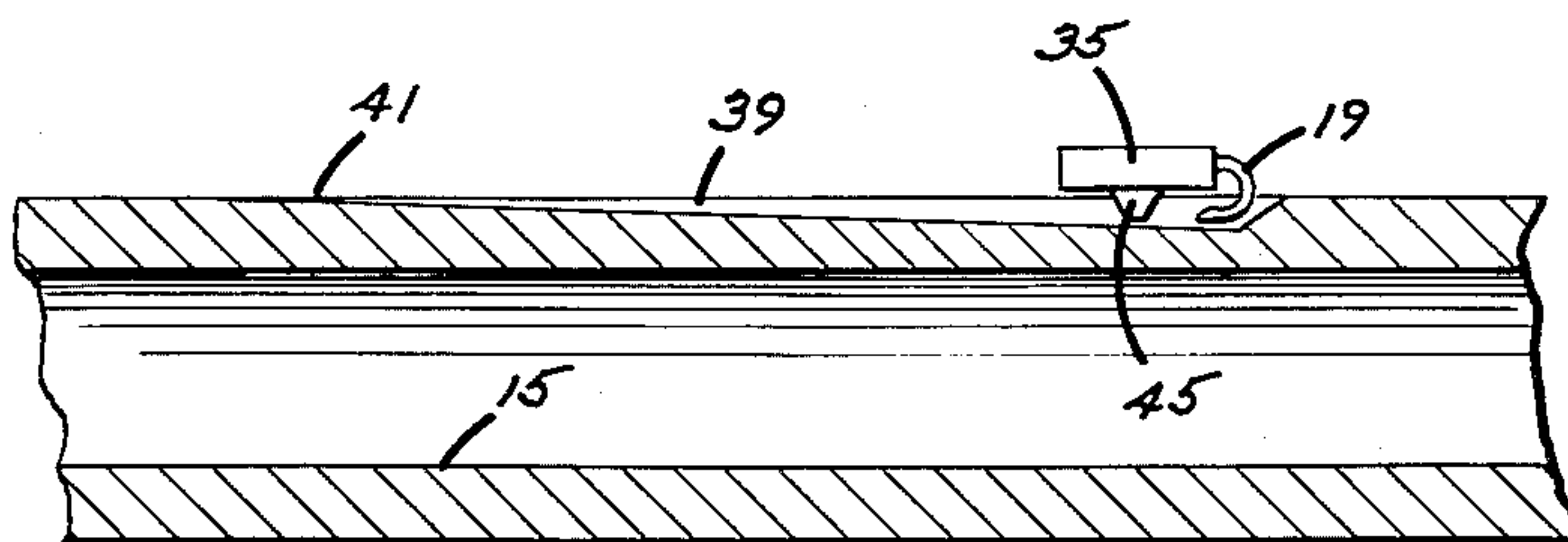
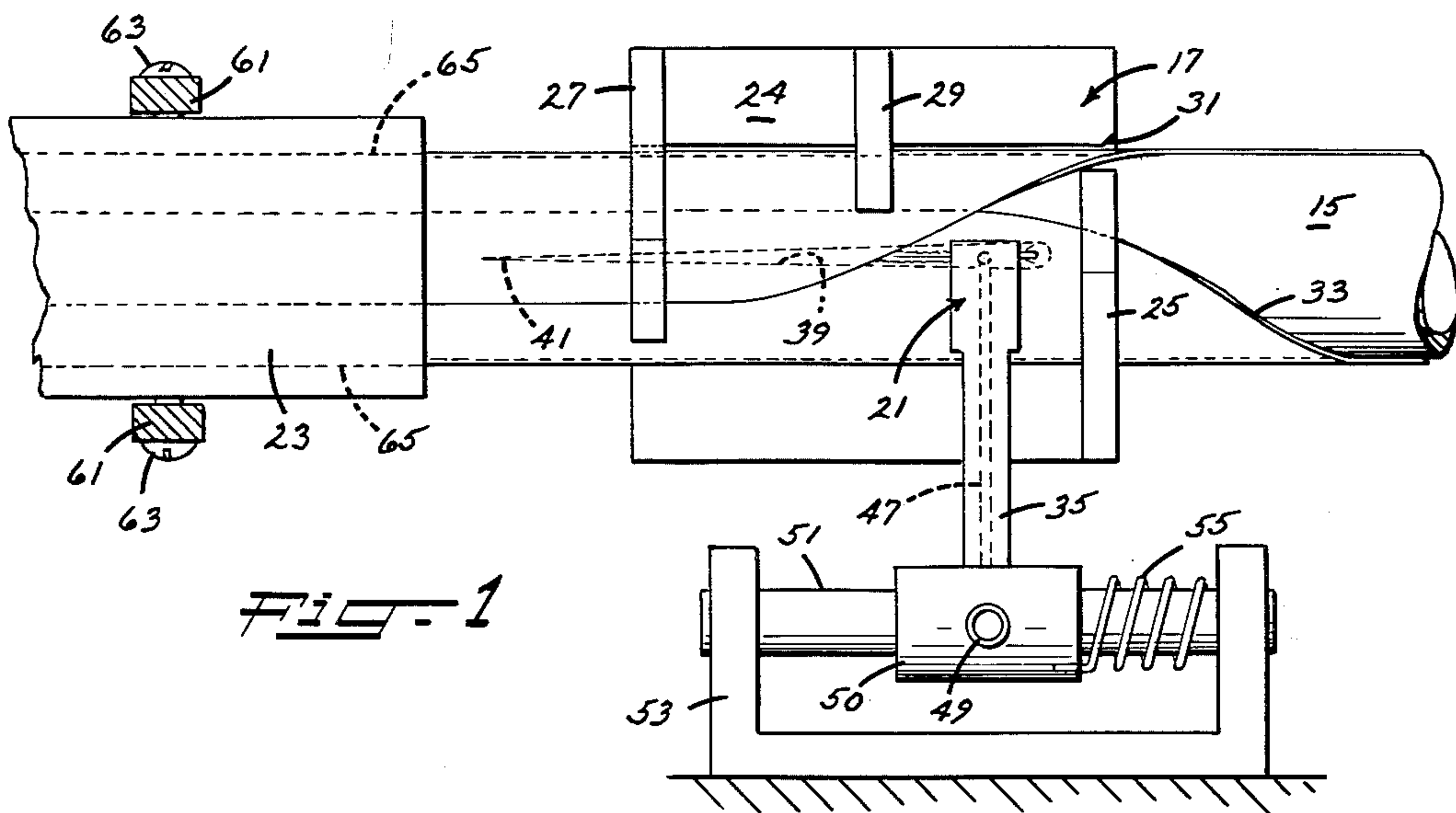
Sept. 20, 1960

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2,953,072

SAUSAGE CASING MANUFACTURE

Filed Sept. 3, 1957



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2,953,072

SAUSAGE CASING MANUFACTURE

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Filed Sept. 3, 1957, Ser. No. 681,756

18 Claims. (Cl. 93—82)

This invention relates in general to method and apparatus for making stuffed products, and more particularly to stuffed product manufacture wherein a stuffing nozzle and adhesive applicator together cooperate to deposit a measured amount of adhesive along a contained path on a continuously traveling sheet material.

In accordance with known procedures for making casings, a continuous traveling sheet material is passed through a former or shaping mechanism which serves to fold or deflect the same into a tubular formation in which the opposite longitudinal edges of the sheet material are disposed in overlapping relationship. An adhesive is employed to bond the overlapping edges of the sheet material and is generally applied before the sheet material is shaped into a tubular formation. With this procedure, however, there exists a tendency for the sheet material to weave from its desired path, especially when travelling through the former mechanism. Under these conditions, the applied adhesive often becomes smeared or smudged before the sheet material edges are actually overlapped, thus leading to an unsatisfactory seal more important, smearing the adhesive tends to spread the same along the internal wall of the casing where it may contact and perhaps contaminate the stuffed product, as for example a foodstuff. Accordingly, a primary object of the present invention is to provide a generally improved and more satisfactory method and apparatus for use in the continuous production of stuffed products.

Another object of the invention is to provide an apparatus for depositing measured amounts of adhesive along controlled and contained paths.

Still another object of the invention is to provide a method and apparatus for crimping or scoring a continuously travelling sheet material concomitantly with the folding thereof into a casing or tubular formation, with provision being made for depositing a liquid adhesive within the scored portion.

A further object of the invention is to provide a stuffing apparatus having a nozzle, grooved on its exterior periphery, and cooperating with a scoring tool and an adhesive applicator to effect a continuous crimping of a travelling sheet material and a concomitant moistening the same with a liquid adhesive.

These and other objects and advantages of the invention will be apparent from the following description and accompanying drawing in which:

Fig. 1 is a bottom view of a portion of a stuffing machine nozzle illustrating a sheet material folder mechanism, scoring tool, and adhesive applicator in use;

Fig. 2 is a central vertical section taken through the apparatus shown in Fig. 1, with the sheet material removed therefrom;

Fig. 3 is a view similar to Fig. 2 illustrating the apparatus of the present invention in use; and

Fig. 4 is a fragmentary detail view of the sheet material scoring tool and the adhesive applicator.

In general, the novel apparatus of this invention includes

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a stuffing nozzle having a longitudinally extending groove on its exterior periphery, a scoring tool disposed adjacent the nozzle groove and serving to depress therein portions of a continuously travelling sheet material, and an adhesive applicator for continuously depositing a measured amount of adhesive within said scored portion concomitantly as the sheet material itself is folded or deflected into a casing or tubing formation about the stuffing nozzle. Preferably, the groove in the stuffing nozzle gradually reduces in width and depth as its exit end is approached so as to cause the adhesively moistened portion of the sheet material to be progressively elevated or flattened as the sheet material leaves the former mechanism. In this manner, an unbroken layer of adhesive exists between the sheet material edges as they are urged and held in overlapping relationship to insure the formation of a highly satisfactory and uniform bond.

While only that portion of the stuffing machine germane to the present invention has been illustrated in the drawing, it will be understood that the method and apparatus described herein is suited for use with known stuffing machines. Incorporating the teachings of the present invention into known stuffing machines in no way impair their intended stuffing functions, and in addition provide full assurance that the overlapping edges of the sheet material will be uniformly and satisfactorily bonded to each other.

With reference to the drawing, there is illustrated a stuffing nozzle or core member 15, a former or folding mechanism 17, a scoring or crimping tool 19, an adhesive applicator 21, and a sealing shoe 23. Briefly, the folding mechanism consists of a main body portion 24 having downwardly projecting end flanges 25 and 27 formed with arcuate surfaces disposed adjacent to but spaced from the stuffing nozzle itself. Intermediate the end flanges 25 and 27 and on the same side as the flange 27, the folding device 17 is provided with a projection 29, also having an arcuate surface which corresponds with the similar surfaces formed on the end flanges 25 and 27. It will be noted the entrance end of the folding device is beveled at 31 to facilitate ease in lacing the sheet material, shown at 33, at the start of the stuffing operation and to prevent any scratching or tearing of the same as it moves relative thereto.

As seen in the Fig. 1, the stuffing nozzle 15 extends through the folder mechanism 17 with sufficient clearance between these parts to allow the free passage of the sheet material therebetween. Upon entry of the sheet material 33 into the folding device, the end flange 25 gradually urges one longitudinal edge of the sheet material downwardly and inwardly into embracing relationship about the stuffing nozzle 15. In this position, the deflected edge portion of the sheet material rides between the stuffing nozzle 15 and a support arm 35. As more fully described hereafter, the sheet material is concomitantly scored and moistened with a narrow strip of liquid adhesive, as shown at 37, during this phase of the casing formation. With continued travel through the folding device 17, the opposite longitudinal edge of the sheet material 33 is initially deflected toward the stuffing nozzle 15 as it rides over the arcuate surface of the projection 29, and is finally disposed into overlapping relationship with the first mentioned longitudinal edge of the sheet material by the end flange 27.

The edge portions of the sheet material are ultimately sealed in their overlapped relationship as they together travel between the sealing shoe 23 and the stuffing nozzle 15 to provide a finished tubular casing. It will be noted that the folding of the sheet material 17 into its casing form does not in any manner interfere with the adhesive application and that the end flanges 25 and 27

and the projection 29 of the folding mechanism 17 perform their intended manipulative operations without contacting the applied adhesive.

With particular reference to the stuffing nozzle 15, there is provided on its exterior surface a groove 39 which extends longitudinally thereof beyond the end of the folding device 17. For purposes as more fully described hereafter, the groove 39 tapers in both its width and depth direction to provide the same with a feathered or pointed discharge end, as shown at 41. Disposed below and projecting into the groove 39 of the stuffing nozzle 15 is the scoring or crimping tool 19 and an adhesive applicator nipple 45, both of which are carried adjacent the free end of the support arm 35. The crimping tool 19 serves to deflect the traveling sheet material into the nozzle groove 39 and thus scores or crimps the same along one of its longitudinal edges.

As best seen in Fig. 4, the scoring or crimping tool 19 is formed with a smooth rounded leading surface so as to gradually depress the traveling sheet material into the stuffing nozzle groove 39 without risk of scratching or tearing the same. Preferably, this scoring tool consists of a wire or other flexible member which can be deformed into a desired configuration and which will readily flex away from the nozzle when the sheet material is subjected to an undesirable increase in tension. In this manner, any excessive pull on the sheet material merely renders the scoring tool temporarily inoperative and thus prevents damage to either the sheet material or the scoring device. It will be understood that the scoring tool 19 automatically returns to its operative position once the sheet material is under normal tension. Along the same lines, it will be noted that the adhesive applicator nipple 45 has the form of an inverted truncated cone which allows this nipple to ride within the trough-shaped crimp in the sheet material without impairing the sheet material travel or damaging the same.

Delivery of adhesive material to the nipple 45 is accomplished by a conduit 47 formed in the support arm 35 and connected at one end to a stem 49. The stem 49 is in turn connected to a suitable source of adhesive, not shown. Both the support arm 35 and the stem 49 are integrally connected to an enlarged section 50 of a rocker shaft 51. A bracket 53, fixed to the framework of the stuffing machine itself, not shown, supports the rocker shaft 51 for a pivotal movement. During operation, however, the arm 35 is urged toward the stuffing nozzle 15 by a tension spring 55 which encircles the shaft 51 and has its ends connected to the shaft section 50 and the bracket 53, respectively. While the support arm 35 is normally held snugly against the sheet material traveling between its free end and the stuffing nozzle 15, it will be evident that during lacing procedures and actual operation of the apparatus, the spring 55 permits the support arm 35 to automatically adjust its position to the particular tension applied to the traveling sheet material.

As the sheet material moves through and away from the folding device 17, the tapered construction of the stuffing nozzle groove 39 gradually and progressively elevates or flattens the crimped portion of the sheet material to the arcuate surface portion of the stuffing nozzle. Therefore, as the flange 27 of the folding device 17 completes the folding of the sheet material about the stuffing nozzle 15, the edge portions of the sheet material are disposed in overlapped relationship with a thin uniform layer of adhesive interposed therebetween. While in this position, both longitudinal edges of the sheet material travel together as a unit toward the sealing shoe 23, which serves to maintain the overlapped edge portions of the sheet material pressed against each other and the periphery of the stuffing nozzle 15.

The sealing or pressure shoe 23 is provided with an upper arcuate face which mates with the periphery of the

stuffing nozzle itself and is preferably formed of a tetrafluoroethylene polymer, known as Teflon, which permits the casing seam to be subjected to pressure without introducing excessive frictional drag. A pair of support arms 61, connected to the pressure shoe 23 at 63, pivotally urge the shoe toward the stuffing nozzle 15, with a spring, not shown, being provided to allow the shoe to adjust its position to the pull on the sheet material, in much the same manner as the support arm 35 heretofore described. It will be noted that the arcuate surface of the pressure shoe 23 presents a relatively wide contact area, denoted by the broken lines 65, and thus insures that the overlapping edges of the sheet materials are pressed firmly together notwithstanding any tendency for the casing to weave from a straight line path. Upon leaving the pressure shoe, the sheet material is in the form of a continuous tube or casing, which may be then humidified and filled with plastic stuffing material.

It will be apparent from the above description, that the present invention permits the traveling sheet material to be concomitantly folded into a tubular or casing shape while one of its longitudinal edge portions is crimped and moistened with a liquid adhesive. The specific construction of the stuffing nozzle and the cooperating scoring tool and adhesive applicator facilitate the uniform deposition of adhesive along desired contained path which is so disposed as to shield the adhesive from being smeared or smudged by the opposite longitudinal edge of the sheet material as it is folded into its final position. In this manner, full assurance is provided that the finished casing seam is uniformly sealed along its entire length by the same metered amount of adhesive as is initially applied to the sheet material. As with known stuffing procedures the internal wall of the finished casing, adjacent the seam area, is preferably treated with a neutralizing solution. It will be recognized, however, that the manner of adhesive application here described eliminates any tendency for the adhesive to spread and thus a smaller amount of neutralizing solution may be employed, and perhaps dispensed with altogether.

It is to be understood that the foregoing description is merely illustrated and that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims:

1. In apparatus for producing continuous tubular casing including a nozzle, means for folding a travelling sheet material about said nozzle with the longitudinal edge portions of the sheet material disposed in overlapping relationship, means for providing only one of the edge portions of the sheet material with a continuous crimp which extends generally parallel to a longitudinal edge of the sheet material, and means for applying a measured amount of adhesive into the continuous crimp of the sheet material before the sheet material edge portions are disposed in overlapped relationship.

2. In apparatus for producing continuous stuffed products including a stuffing nozzle, means for folding a travelling sheet material about said stuffing nozzle with the longitudinal edge portions of the sheet material disposed in overlapping relationship, and means for providing only one of the edge portions of the travelling sheet material with a continuous crimp which extends substantially parallel to a longitudinal edge of the sheet material, and concomitantly depositing a liquid adhesive into the continuous crimp before the sheet material edge portions are disposed in overlapped relationship.

3. In apparatus for producing continuous stuffed products including a stuffing nozzle, means for folding a travelling sheet material about said stuffing nozzle with the longitudinal edges of the sheet material disposed in overlapping relationship, a groove formed in the periphery of said nozzle and extending longitudinally thereof and means for depressing an edge portion of the travelling sheet material into said groove to score the same and concomitantly deposit a liquid adhesive along said scored

portion before the sheet material edges are disposed in overlapped relationship.

4. Apparatus as defined in claim 3 wherein said groove terminates beyond the discharge end of said first mentioned means.

5. Apparatus as defined in claim 3 wherein said groove gradually reduces in width as its discharge end is approached.

6. Apparatus as defined in claim 3 wherein said groove gradually reduces in depth as its discharge end is approached.

7. Apparatus as defined in claim 4 wherein said groove gradually reduces in both width and depth as its discharge end is approached.

8. In apparatus for producing continuous stuffed products including a stuffing nozzle, means for folding a travelling sheet material about said stuffing nozzle with the longitudinal edges of the sheet material disposed in overlapping relationship, a groove formed in the exterior surface of said nozzle and extending longitudinally thereof, said groove being located adjacent to said folding means, means for depressing an edge portion of the travelling sheet material into said groove to crimp the same, and means disposed in trailing relationship with said sheet material depressing means for applying a liquid adhesive to the crimped portion of the sheet material, said sheet material depressing means and adhesive applicator means located adjacent to the entrance end of said folding means to effect sheet material crimping and adhesive application before the sheet material longitudinal edges are disposed in overlapped relationship.

9. Apparatus as defined in claim 8 wherein said groove gradually reduces in both width and depth as its discharge end is approached to cause the adhesively moistened crimped portion of the sheet material to be flattened as the sheet material edge portions are overlapped.

10. Apparatus as defined in claim 9 further including a sealing shoe partially embracing said stuffing nozzle for maintaining the overlapped longitudinal edge portions of the sheet material pressed against each other and the periphery of the stuffing nozzle.

11. Apparatus as defined in claim 8 wherein said sheet material depressing means and adhesive applicator means are carried at the free end of a support arm, and further including resilient means for urging said support arm toward the stuffing nozzle.

12. Apparatus as defined in claim 8 wherein said adhesive applicator means includes a nipple projecting into said stuffing nozzle groove.

13. Apparatus as defined in claim 8 wherein said sheet material depressing means is formed of flexible material.

14. Apparatus as defined in claim 13 further including a support arm and wherein said sheet material depressing means is a wire connected at one end to said support arm and formed with a reverse bend to provide a smooth rounded leading edge.

15. In a method for producing stuffed products including the steps of deflecting successive portions of a longitudinal edge of a continuous travelling sheet material along an arcuate path, scoring said sheet material continuously along a path extending substantially parallel to said longitudinal edge, applying an adhesive to said scored portion of said sheet material, deflecting the opposite longitudinal edge portion of the sheet material into overlapping relationship with the first-mentioned longitudinal edge portion, and pressing said overlapping edge portions against each other to provide a continuous finished casing.

16. A method as defined in claim 15 wherein said scored portion of the sheet material is flattened as the opposite longitudinal edges of the sheet material are disposed in overlapped relationship.

17. Apparatus for producing a tubular product including an elongated core member, means for folding a travelling sheet material about said core member with the longitudinal edge portions of the sheet material disposed in overlapping relationship, means for providing one edge portion of the sheet material with a continuous crimp which extends generally parallel to an adjacent longitudinal edge of the sheet material, and applying an adhesive into the continuous crimped portion thereof before the sheet material edge portions are disposed in overlapping relationship and means cooperating with said core members for pressing the overlapped edge portions of the sheet material together.

18. A method of making a tubular product including the steps of deflecting one longitudinal edge portion of a sheet material along an arcuate path, scoring the sheet material to provide a continuous crimp therein extending along a path adjacent to said longitudinal edge, applying an adhesive to the continuous crimped portion of the sheet material, deflecting the opposite edge portion of the sheet material into overlapping relationship with the first-mentioned longitudinal edge portion and pressing said overlapping edge portions against each other to seal the same.

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