

Feb. 8, 1944.

A. J. FREEMAN

2,340,951

MANUFACTURE OF CASINGS

Filed Aug. 22, 1938

3 Sheets-Sheet 1

*Fig. 1.*

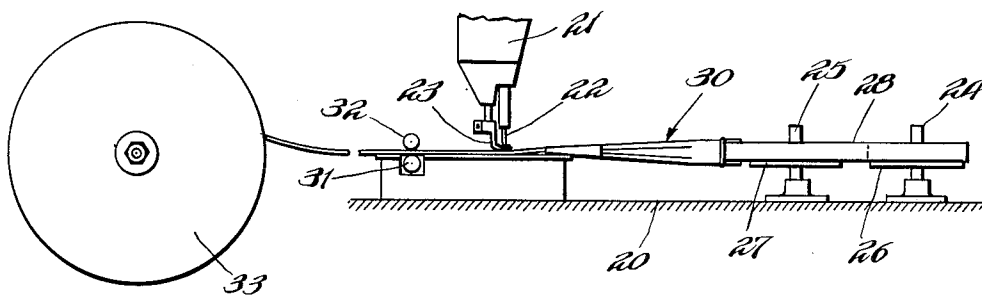


*Fig. 2.*

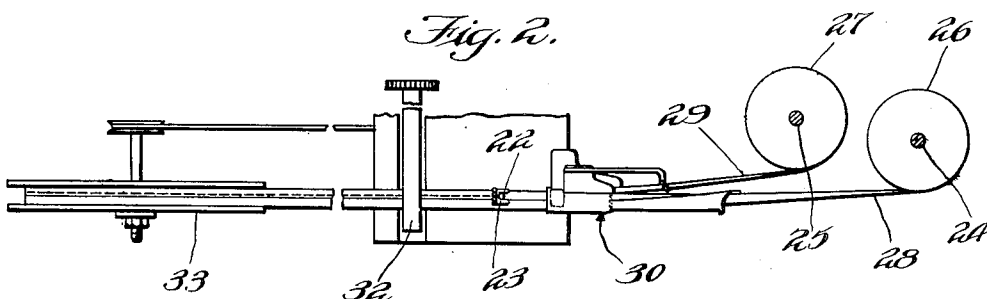


*Fig. 3.*

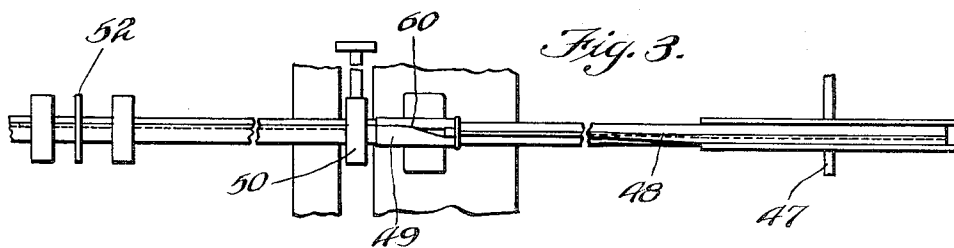
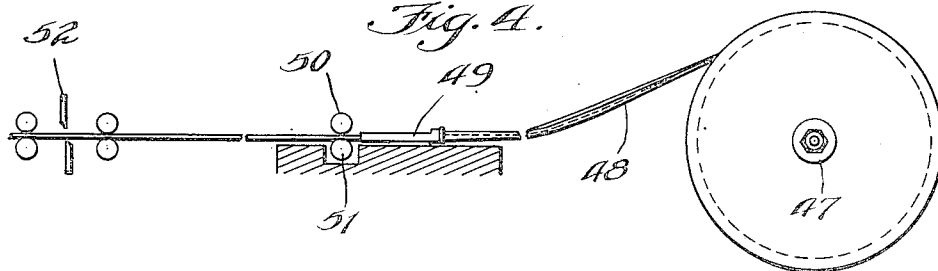


*Fig. 4.*



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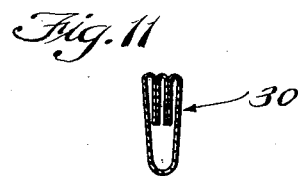
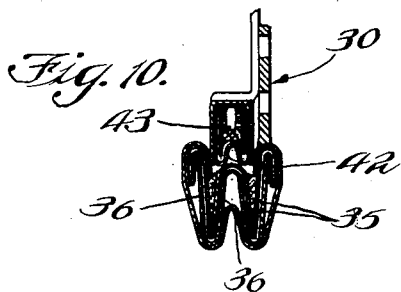
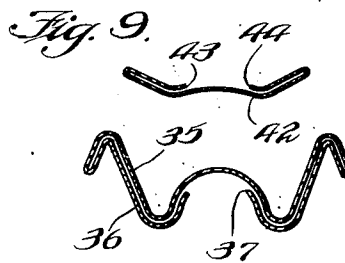
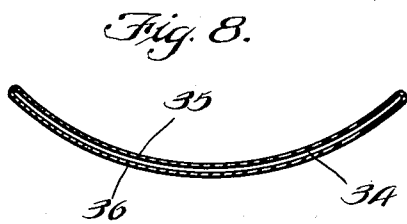
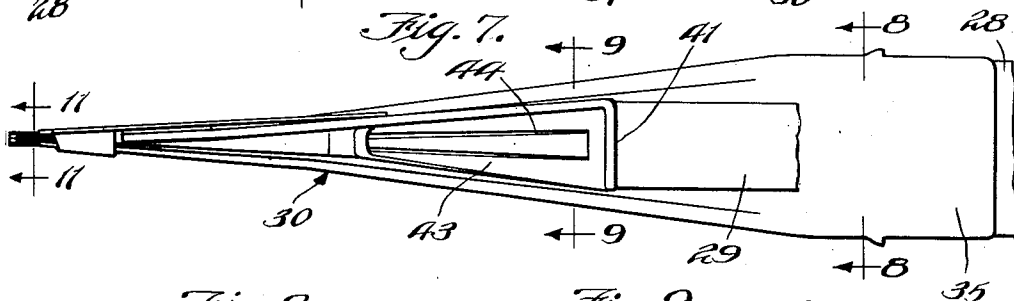
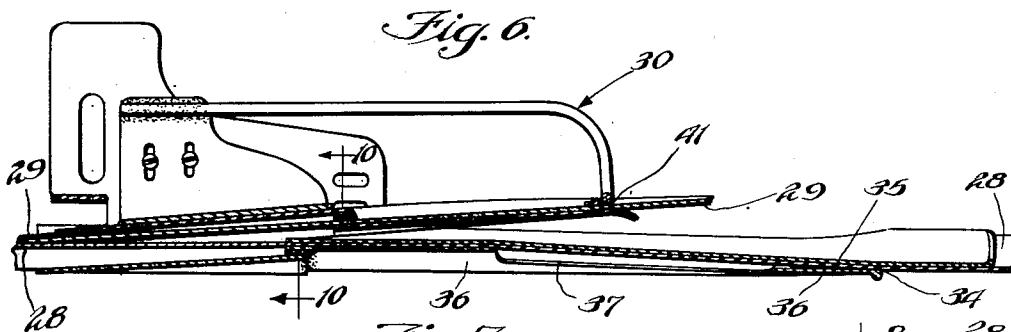
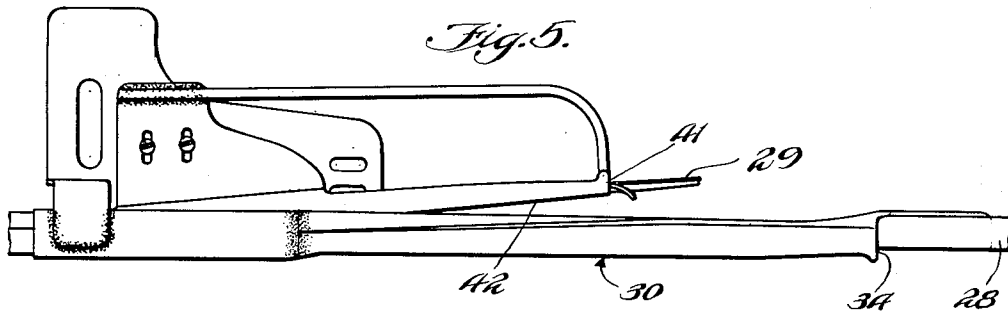
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MANUFACTURE OF CASINGS

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*Fig. 12.*

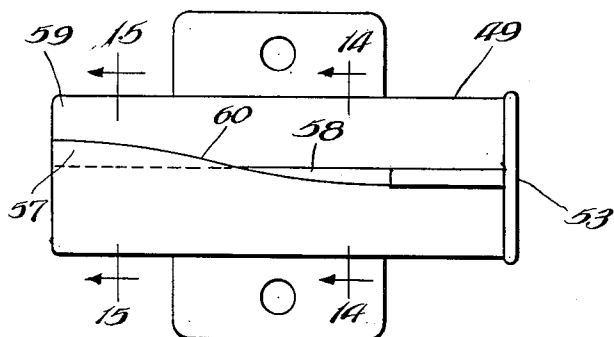


*Fig. 13.*

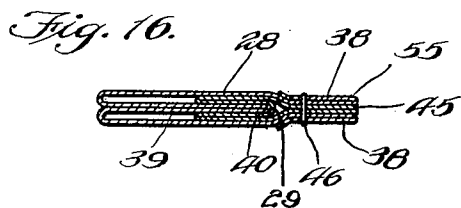
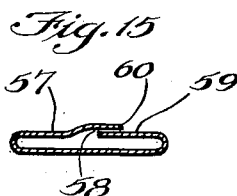
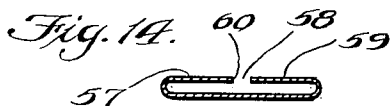
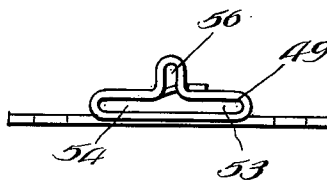


*Fig. 18.*

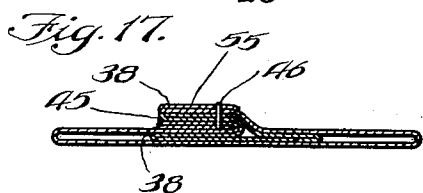
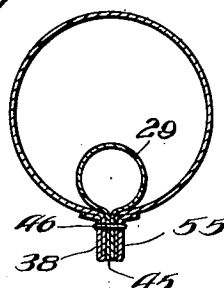
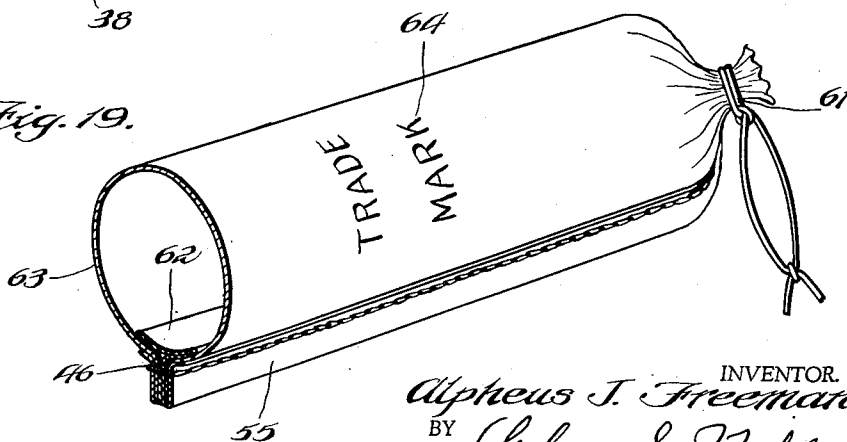


*Fig. 19.*



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## UNITED STATES PATENT OFFICE

2,340,951

## MANUFACTURE OF CASINGS

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Application August 22, 1938, Serial No. 226,113

6 Claims. (Cl. 112—63)

This invention relates to the manufacture of casings from strips of paper or other suitable material and includes the method of making the same and apparatus for performing the necessary operations. The casing referred to herein is formed from strips of paper by sewing the edges together to make tubing and preferably comprises two strips, one of which forms an inner flap or seal for the longitudinal seam as will be more particularly described hereinafter. Such a casing is shown, described, and claimed in my co-pending application for Casings, Serial No. 222,428, filed August 1, 1938, and as far as I am aware has never been disclosed prior to my invention thereof.

The objects of this invention are to provide an improved machine or apparatus for making tubular casings from paper or the like; to provide means for folding one or more strips of paper and sewing the same along the edges; to provide means for folding two strips of paper together with their edges in overlapping relation and sewing the same along such edges to provide a tube or casing with an inner seal or welt; to provide means for interfolding two strips of material and sewing the combined edges thereof to make a casing and to modify or change the shape of the casing after being sewn, whereby it will be in proper form for use; and to provide such other improvements in the apparatus and parts thereof, and also the method and product as will appear more fully hereinafter.

In the accompanying drawings illustrating this invention,

Figure 1 is a side view of my improved apparatus for forming, sewing and winding up the casing;

Figure 2 is a plan view of the same;

Figure 3 is a plan view showing the mechanism for changing or modifying the shape of the sewed tube and cutting the same in sections;

Figure 4 is a side view of the parts shown in Figure 3;

Figures 5 to 11 are details of the folder which serves to fold the two strips of paper and bring them into the desired relationship for sewing;

Figures 12 to 15 are details of the device for re-folding or changing the cross section of the tube or casing from its form as it leaves the sewing machine to the final form for use;

Figure 16 is a cross section of the tube or casing after it leaves the sewing machine;

Figure 17 is a cross section showing the change after it has passed through the re-forming device shown in Figures 12 to 15;

Figure 18 is a cross section of the casing ready for use, as for instance after having been soaked preparatory to being placed on the stuffer horn; and

Figure 19 is a perspective view showing the casing as it would appear on the horn or after having been stuffed.

The drawings are more or less diagrammatical as some of the parts or mechanisms are of standard or well known construction and other parts such as the strips or casing are shown enlarged as the paper ordinarily used will be parchment paper, preferably treated with a softening agent such as glycerine, or the like, which paper is usually thin.

As shown in these drawings 20 indicates a table or support on which is mounted any suitable sewing machine as indicated at 21, having a needle 22 and presser foot 23. Two spindles 24 and 25 are mounted on the table and carry rolls 26 and 27 of paper or other suitable material for forming the casings. The strip 28 which is wound in the roll 26 is of sufficient width to form the casing proper, and the strip 29 which is formed into the roll 27 is substantially narrower and adapted to form the inner seal or flap. These two strips are pushed or fed through a folder designated generally by the numeral 30 and then under the needle 22 and engage with rollers 31 and 32 which are driven in any suitable manner and which serve to pull the strips from their supply rolls and through the sewing machine as the casing or tubing is being formed. After the casing is formed it may be disposed of in any suitable manner, as by being wound on a reel 33 which may be driven in any suitable manner, preferably by means of a slight or friction drive in order to accommodate the variation in the size of the roll formed thereon.

The folder 30 will be best understood when taken in connection with the section of the casing after being sewn, as shown in Figure 16.

The strip 28 passes into a throat 34 at the entrance or inlet end of the feeder, the walls 35 and 36 of the throat being curved as shown in Figure 8. The walls are gradually bent or grooved longitudinally of the folder until the cross section changes from that shown in Figure 8 to that shown in Figure 9 at approximately the center of the folder. Beginning at about this point a longitudinal slot 37 is provided in the wall 36 to permit pushing or feeding the strip through the throat when the apparatus is to be started. The cross sec-

tion of the throat or passageway gradually changes from the form shown in Figure 9 to that shown in Figure 10 and the cross section at the outlet as shown in Figure 11. This folder is of such conformation that the strip 28 is folded so that the cross section is changed from the flat strip to that shown in Figure 16. As shown in this figure the strip 28 has its edges 38 folded back upon themselves, thus making four thicknesses along the corresponding edge of the casing. At the same time the opposite side is folded inwardly to form two adjacent layers 39 which are folded with a longitudinal fold 40.

The folder 30 is of a duplex character and has another throat 41 for receiving the strip 29 which is fed into inter-folded relation with the strip 28 as shown in Figure 16. The throat or inlet 41 is formed by an inner wall 42 and an outer wall 43 and is of approximately the cross section shown in Figure 9 at the point indicated by the line 9-9 on Figure 7. The outer wall 43 is also preferably provided with a slot 44 for convenience in sliding the strip through the folder. This portion of the folder also tapers longitudinally toward the outlet as indicated in the cross sections shown in the drawings. The arrangement of these throats or feeding members is such that when the two strips pass out at the outlet, the edges 45 of the strip 29 will be interposed between the folded back edges 38 of the strip 28 preparatory to receiving the sewing or stitching 46 as shown in Figure 16. At the same time the opposite wall of the strip 28 will be folded in a manner similar to the wall of the outer strip so that the fold or edge 40 will be interposed between the adjacent folded portions of the inner strip as shown in this figure.

With the strips inter-folded as shown and described, the casing passes through the sewing machine 21 which makes the stitching 46 and is drawn along by the feed rollers 31 and 32 and from thence passes to the winding reel 33 upon which it is made into rolls. The stitching is preferably of the double-lock seam type which passes through six thicknesses of material and will hold the edges securely together along the joint thus formed. While such stitching or sewing is preferred, other means of fastening the plies together for forming a longitudinal joint may be utilized.

While the fabricating of the tube is completed with the stitching it is desirable to reshape or open the tubular members so that they will be in the form shown in Figure 17 when the casing is to be used. For this purpose the rolls of completed tubing are removed from the apparatus shown in Figure 1 and mounted on a shaft 47 or other suitable support so that the completed tube or casing 48 is in position to be drawn through another folder or shaper 49 which is mounted on any suitable support as shown in Figures 3 and 4. The casing is drawn through this folder by means of rolls 50 and 51 which may be driven in any suitable manner. If desired a shear or cutter 52 may be arranged adjacent to the rolls for cutting the casing into any desired lengths. Any suitable shearing or cutting apparatus may be used for this purpose but preferably one which will automatically cut the casing into such lengths.

The folder or shaper 49 as shown in Figures 12 to 15 has a T-shaped inlet or throat 53 as shown in Figure 13. When the completed tubing 48 is to be drawn through the shaper the interfolded tubular portions are spread out so

that they fit in the horizontal slot 54 and the rib or projecting portion 55 of the casing is positioned in the vertical or transverse portion 56 of the throat and the casing will be held in this shape as it passes into the folder 49. However one of the top walls 57 extends over the longitudinal slot 58 and overlaps the other wall 59 so that the rib or projection 55 will engage with the curved edge 60 and be folded down against the top surface of the tubular portion as shown in Figure 17. The rollers 50 and 51 then press all of the parts together so that the resulting completed casing is of the cross section shown in Figure 17. After it has been pressed into this form the casing may be cut into any desired length by means of the knife 52 and is then ready for use. From my experiments in connection with the manufacture of tubes from paper I have found that it is an exceedingly difficult matter to make a sewed tubing which will be sufficiently straight and of uniform cross section and with a sufficiently tight seam for commercial purposes. For instance, if a strip of paper is folded longitudinally to bring the edges together and the edges then sewn, the effect of the stitching is such that the resulting tube would be irregular and crooked and of no substantial commercial use. On account of my unique method which includes the step of inserting a reverse fold of the outer tube in a corresponding reverse fold of the inner tube as shown in Figure 16, there will be at the area of overlapping, eight thicknesses of material extending longitudinally along the center of the partially completed casing and there are four thicknesses of material at one side of the interfolded portions and six thicknesses of material along the edges to be sewn together. On account of the relatively thicker central portion the pulling rollers 31 and 32, which are preferably faced with soft rubber, will press tightly against the central portion of the casing and will draw the folded members straight through the sewing machine whereby the stitching will be straight and the rollers will press all of the folds closely together and flatten out the partially completed casing so that it may be wound uniformly on the reel 33.

It will also be noted that the special folding of the strip for making the main tube of the casing is of particular importance, the strip when folded being in the form of a transversely flattened W with downwardly projecting folded edges which terminate short of the reverse center fold, thus providing four thicknesses of material on both sides of the folded strip which permits it to be properly drawn through the rolls.

After the fabrication of the casing has been completed as shown in Figure 16, it then becomes necessary or desirable to unfold or open out the outer tube and flatten the inner tube against the seam in order that the casing may be properly and conveniently used. For this reason the last or unfolding step is necessary in order to fully complete the casing or to present it in the most desirable manner for commercial use.

As far as I am aware there has been no known method of making long continuous tubes of paper or the like with sewn seams and this was first accomplished in accordance with my invention.

In the manufacture of these casings the strips used are furnished in rolls of from one thousand to twenty-five hundred feet in length and

the entire roll will be passed through the folders and sewing machine at a very high rate of speed.

These casings may be made of any desired size and may be used for any purpose for which they may be adapted but are specially intended to be used for containing food products, and particularly sausage, meat cuts, cheese, or the like. These casings have also been used in large quantities for packaging ice cream.

When these casings are to be used for sausage, one end is closed by being tied, stapled or otherwise fastened together as shown at 61, and the casing is then soaked preparatory for slipping onto the stuffer horn. The folded inner portion of the strip 29 assumes a generally tubular form which is flattened against the horn so that it provides an inner longitudinal flap, seal or welt 62 which lies against the inner surface of the tubular outer casing member 63 as shown in Figure 19. This not only provides a closure or seal for the seam but assists in slipping the casing onto the horn and facilitates its being drawn off from the horn as it is stuffed. I have found that without this inner flap it is very difficult, if not impractical, to apply a tubular paper casing to such a stuffer horn. This inner tubular flap evidently permits air to escape and also provides an irregular surface for engagement with the horn. These casings may be printed in any desired legion, as for instance a trade-mark or name of the manufacture, or the like, as indicated at 64, such printing being preferably done prior to forming the strip into the casing.

After the casing has been filled with sausage meat it may be linked and processed in the usual manner but is preferably smoked in long lengths and then cut into short sections for use or sale. The rib or projection 55 provides means whereby the casing may be readily torn off or removed from the filling by holding the sausage in one hand and pulling on the rib which causes the paper to tear along the sides, usually at the edges of the flap 62. This also permits the ready manufacture of "skinless" wieners. The provision of any suitable longitudinal rib of this form is a very important feature of the invention for facilitating the removal of the casing, which removal is more or less impractical or difficult with other forms of casings.

While I have shown a preferred embodiment of my invention it is apparent that changes may be made in the arrangement of the parts, in the method and in the resulting product, without departing from the scope of the invention as particularly set forth in the following claims, in which I claim:

1. The method of forming a casing which consists in arranging two webs of suitable material of different widths, bringing the webs together and folding the same longitudinally with the narrower web within the wider web, and simultaneously folding back the edges of the outer web and forming creases in the centers of both webs with a fold of the outer web interposed between two folds of the inner web, then stitching all of the edges together and leaving a projecting rib, then pressing the same by means of puller rolls, and finally opening the tubular portions and rolling out the creases previously formed therein whereby the completed casing will be in the form of a tube with a longitudinal tubular welt along the joint.

2. The herein described method of forming a

tube from two strips of suitable material of different widths which consists in forming a crease along the center of the narrower strip and bringing the edges of the strip together, and simultaneously forming a crease along the center of the wider strip and inserting the fold in the crease in the narrower strip and folding back the edges of the outer strip and bring them into alignment with the edges of the inner strip, then fastening the edges together by means of stitching through the six thicknesses of material along the edges, then flattening the parts together, and finally opening out the folded portions to form two substantially flattened tubes as shown herein.

3. The method of making a tubular casing from two strips of paper or the like, one of which is narrower than the other, which includes the continuous folding of the narrower strip longitudinally with a re-entrant fold along one side and the edges brought together, and simultaneously folding the wider strip with a continuous longitudinal fold with a re-entrant portion tucked into the re-entrant fold of the first-named strip and with the edges reversely folded and brought against the edges of the first-named strip and fastening all of the edges together by stitching through the edges of the narrower strip and the folded edges of the wider strip.

4. A folder for folding substantially endless strips for making a casing, comprising guide plates forming a tubular passageway through which a strip to be folded may be drawn, the inlet throat of said passageway being substantially straight longitudinally and slightly curved transversely, said plates being tapered longitudinally and the tubular passageway shape transversely to deform said passageway into substantially W-shape in cross section and then further deformed transversely, the walls being gradually closer together laterally up to the outlet which is of tapered U-cross section with three longitudinal slots in one side thereof, the center slot being for the center fold of the strip to be folded and the side slots being for the edge folds of the strip whereby a strip as it passes through the folder will be folded longitudinally with a central inwardly projecting fold and the edges folded back as described.

5. The method of making a tubular casing of parchment paper or the like, which consists in providing a long strip of paper, then drawing the strip through a folder having passageways for engagement with the strip to make a reentrant fold along the center of the strip whereby four thicknesses will be present in such portion and folding back the edges of the strip against the respective outer surfaces so that they terminate short of the reentrant fold and provide four thicknesses of material along the edges, drawing the strip through the folder and simultaneously drawing the same through a sewing machine to sew the strip through the four thicknesses adjacent to the edge and leaving a projecting rib, said strip being drawn through the folder and the sewing machine by means of rollers, the reentrant fold providing four thicknesses on both edges of the casing as it is drawn through the sewing machine by the rollers whereby the casing will be fed evenly through said machine.

6. An apparatus for making long casings of the kind described from very long strips of paper, comprising supports for two supply rolls of strips of substantially different widths for forming the casing, a folder through which the strips

are simultaneously passed without being attached to each other and interfolded to form inner and outer tubular members with their edges in overlapping relation, the narrower strip forming the inner tubular member, means for sewing the edges of the strips together longitudinally as they are drawn through the folder to form the casing, and means for drawing the strips through the folder and the sewing means, said folder having one passageway for receiving the casing

strip and gradually folding the edges back against the outer surface and also forming a central inwardly extending fold, said folder having a second passageway for a sealing strip, adapted to fold the central portion of the strip over said inwardly extending fold and to bring the edges of the strip between the folded back edges of the casing.

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