Dec. 24, 1940. A. G. ROSE 2,225,888

WRAPPING OF CIGARETTES AND OTHER ARTICLES

Filed Feb. 2, 1940 2 Sheets-Sheet 1

FIG.5.

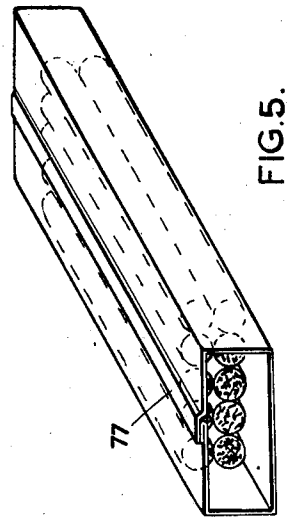


FIG.1.

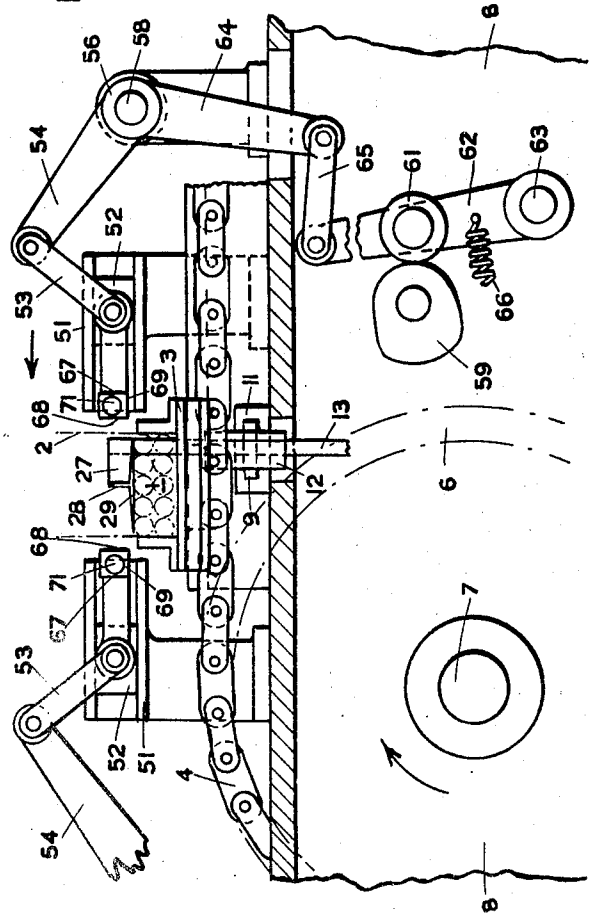
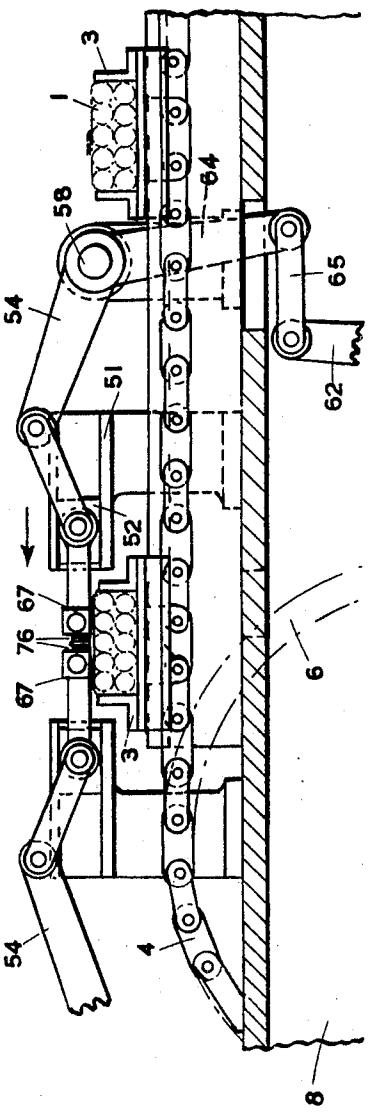


FIG.3.



Inventor
A. G. Rose.

by
Munn Anderson & Liddy
Attorney

Dec. 24, 1940. A. G. ROSE 2,225,888

WRAPPING OF CIGARETTES AND OTHER ARTICLES

Filed Feb. 2, 1940 2 Sheets-Sheet 2

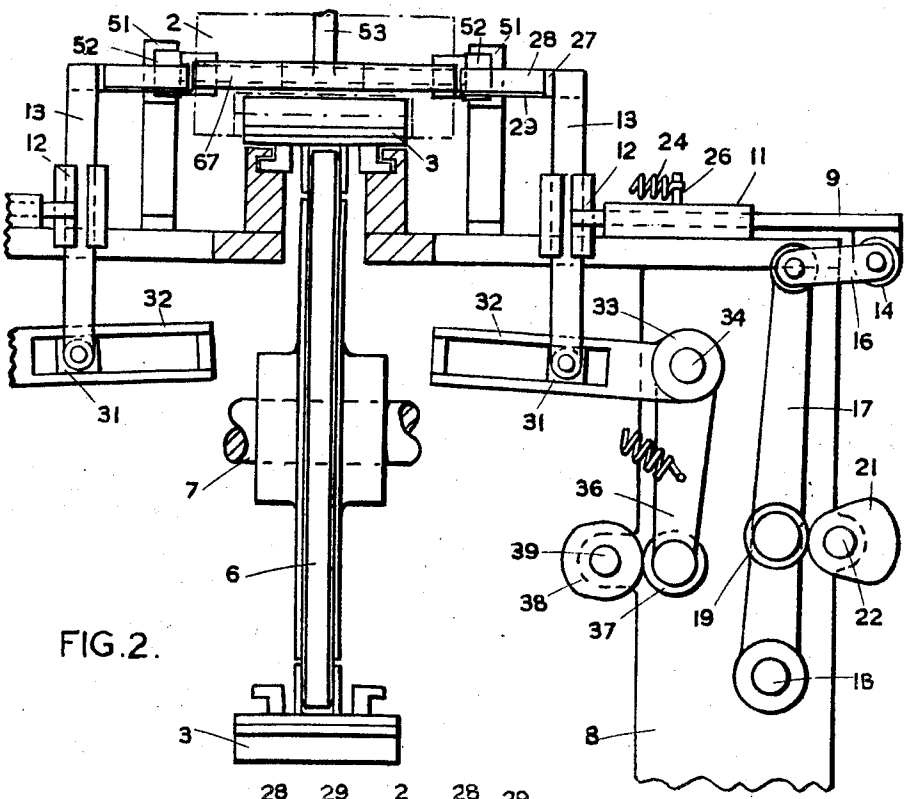


FIG.2.

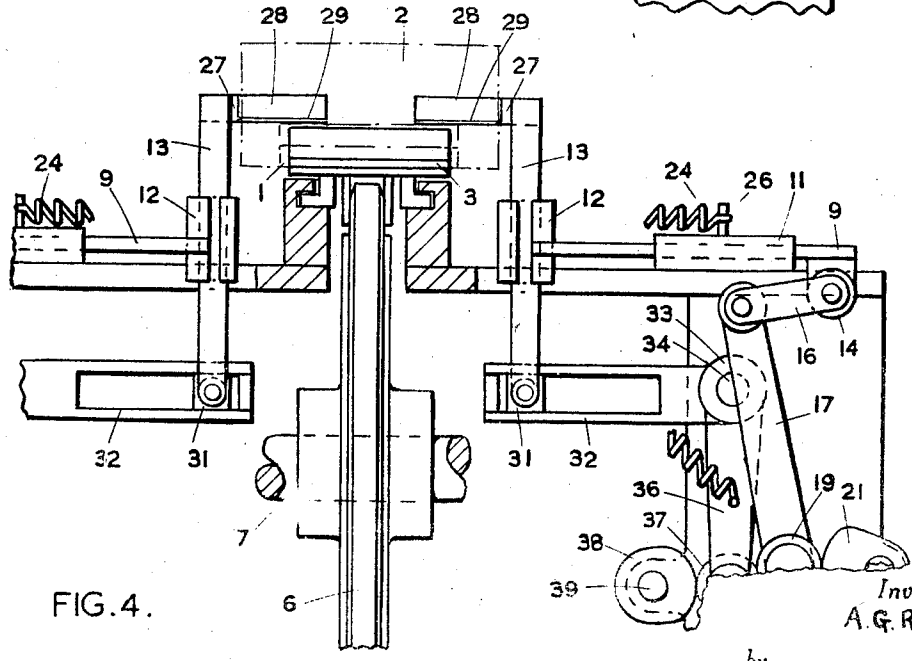


FIG.4.

Inventor
A. G. Rose.

by
Munn Anderson & Fidley
Attorneys

Patented Dec. 24, 1940 2,225,888

UNITED STATES PATENT OFFICE

2,225,888

WRAPPING OF CIGARETTES AND OTHER ARTICLES

Alfred German Rose, Gainsborough, England, assignor to Rose Brothers (Gainsborough) Limited, Gainsborough, England

Application February 2, 1940, Serial No. 316,957
In Great Britain January 30, 1939

17 Claims. (Cl. 93—2)

The invention relates to the wrapping of articles such as a batch of cigarettes and is concerned with the method of wrapping in which a tube of greater length than the article and of cross-section corresponding to that of the article is first formed by folding a wrapper blank of paper, foil, or like material, around the article itself or around a former, the edges of the blank are then secured to form a seam extending longitudinally of the tube, and the ends of the tube are then closed, after insertion of the article into the tube if it is not already there, by folding over the ends of the tube walls. For convenience in describing the invention, a former about which the tube may be formed is included in the term "article."

The invention is concerned with the operation of producing the longitudinal seam and has for its object the formation of a seam of a particularly high degree of air-tightness and by a method and apparatus which avoids damage to the article. The invention is also concerned with the new or improved package resulting from the method of producing the longitudinal seam.

In accordance with the present invention, a method of wrapping a batch of cigarettes or other articles comprises folding a wrapper of paper, foil, or similar material, of a width greater than the length of the article and of a length greater than the periphery of the article, about the bottom and two opposed sides of the article, so as to leave a length of wrapper upstanding from each of said opposed sides, inserting a longitudinal web between the upstanding lengths of wrapper at the position where the seam is to be, pressing the said lengths into the angles between the web and the article in such a manner as to cause the said lengths to fold over so that intermediate portions of the wrapper lie along the upper surface of the article and the end portions lie against opposite sides of the longitudinal web in the form of longitudinal flanges, withdrawing the web from between the flanges, with the wrapper still held in the position into which it has been pressed, to allow the opposing faces of the flanges to be pressed together, and securing the flanges together by adhesive material to form a longitudinal seam upstanding from the article. The seam formed in this way may then be folded down on to the wrapper.

Conveniently, the wrapper material is pretreated with an adhesive material of the kind which is normally inert but which may be rendered active to cause adhesion by means of heat, and the securing of the flanges is brought about by nipping the flanges together between a pair of heated surfaces. Wrapper material treated in the above manner is referred to hereinafter as "heat-sealing material." An apparatus for carrying the above method into effect may comprise means for folding a wrapper about the bottom and two opposed sides of the article leaving a length of wrapper upstanding from each of said opposed sides of the article, a longitudinal web adapted to be moved into position on the article between the upstanding lengths of wrapper, means for pressing the said lengths into the angles between the web and the article in such a manner as to fold the said lengths over the article with their end portions lying against opposite sides of the web in the form of longitudinal flanges, means for withdrawing the web from between the flanges while the wrapper is held in position by the pressing means, and means for securing the flanges together by adhesive material to form a longitudinal seam upstanding from the article. Means may be provided for folding the longitudinal seam down on to the wrapper. The pressing means may be in the form of a pair of presser members movable up to the opposite sides of the web over the adjacent surfaces of the article and each having a cross-sectional shape (e. g., having two faces at right angles if the web is perpendicular to the face of the article) which fits closely into the angle between the web and the article. Conveniently, one of the presser members performs the additional function of folding the longitudinal seam down on to the article by a further relative movement between the article and the presser member.

If the wrapper employed is formed from heat-sealing material, the presser members preferably incorporate heating means.

When wrapping an article which is not self-supporting, for example, a batch of cigarettes, it is preferable to employ a wrapper guiding member, adapted to be moved into position on the article between the article and the longitudinal web, with an edge lying substantially coincident with each longitudinal edge of the article on the side where the seam is to be formed, the wrapper being pressed over the guiding member to enclose it temporarily with the article. The guiding member may be withdrawn before or after the flanges of the wrapper are secured together. The use of such a guiding member prevents portions of the article from becoming displaced during the pressing of the wrapper into

the angles between the web and the article due to the tendency of the wrapper to compress the article under the influence of the pressing means, especially where wrappers of substantial thickness are used. The guiding member may be combined with the longitudinal web to form a member of inverted T-section, which is conveniently made in two parts, each of T-section which are inserted in alignment with each other between the upstanding lengths of wrapper, one from each end of the article.

By way of example, the invention as applied to the wrapping of a rectangular batch of cigarettes will now be described in greater detail with reference to the accompanying diagrammatic drawings, in which:

Figure 1 is a part-sectional elevation of part of a cigarette wrapping machine employing apparatus in accordance with this invention;

Figure 2 is a part sectional end view of the apparatus shown in Figure 1 viewed in the direction of the arrow shown in Figure 1 with certain parts removed for clarity of illustration;

Figure 3 is a further elevation of the apparatus shown in Figure 1 showing the dispositions of various parts at a later stage in the operation of the machine;

Figure 4 is an end view of part of the apparatus shown in Figure 3 viewed in the direction of the arrow shown in Figure 3; and

Figure 5 is a perspective view of the package formed by the apparatus shown in Figures 1 to 4.

Referring to Figures 1 and 3, a batch 1 of cigarettes is prepared and pressed into a wrapper blank 2, which is made of heat-sealing material, to fold the blank about the bottom and two opposed sides of the batch 1, by the machine described in British Specification No. 352,659.

The batch 1 of cigarettes in the wrapper blank 2 is carried in one of a series of supports 3 (one only shown in Figure 1), mounted on a chain 4 which is carried by a sprocket 6 carried on a shaft 7 mounted in bearings in the main framework 8 of the machine. The chain 4 is driven intermittently and carries the supports 3 to successive points in the wrapping machine where different wrapping operations are performed on the batches of cigarettes in the supports. In Figures 1 to 4 the support 3 is at rest at one of such points.

Mounted for movement in directions transverse to the direction of movement of the support 3 is a pair of rods 9 slidably mounted in tracks 11 attached to the framework 8 on opposite sides of the chain 4. Each of the rods 9 has attached to it, at one end, a housing 12 in which is mounted a sliding member 13, and at the other end a boss 14 on which is pivoted one end of a link 16 having its other end pivoted on an arm 17 pivoted at 18 on the framework 8.

The arm 17 is provided with a cam roller 19 bearing against the face of a rotatable cam 21 mounted on a shaft 22. A spring 24 attached to the housing 12 and to a post 26 secured to the framework 8 maintains contact between the cam roller 19 and the cam 21.

The upper ends of the sliding members 13 are secured to members 27 a part of each of which is of inverted T-section, having a longitudinal web 28 and a base portion 29. The lower end of each of the sliding members 13 is secured to a block 31 slidably mounted in one arm 32 of bell crank lever 33 pivotally mounted on the framework 8 at 34, the other arm 36 of the bell crank lever being provided with a cam roller 37 bearing against the face of a rotatable cam 38 mounted on a shaft 39 supported in the framework 8.

It will be seen that, in the drawings, the operating mechanism associated with the members 27 is not completely shown in each case. It will be understood, however, that the members 27 are provided with similar operating mechanisms working in synchronism.

Secured to the framework 8 at positions spaced apart in the direction of the length of the chain 4 are two pairs of tracks 51 (one of each pair only being shown in Figures 1 and 3) in each of which is mounted a sliding member 52. Each sliding member 52 is caused to reciprocate in its tracks 51 because of its connection by a link 53 to one arm 54 of a bell crank lever 56 which is caused to rock about a shaft 58 under the action of a cam 59 co-operating with a cam roller 61 carried by an arm 62 pivoted at 63 and connected to the other arm 64 of the bell crank lever 56 by a link 65. A spring 66, connected to the arm 62 and the framework 8, maintains contact between the cam roller 61 and the cam 59.

A presser member 67 is attached to each of the sliding members 52, the presser members each having two surfaces 68 and 69 disposed substantially at right-angles to each other to correspond with the angles between the web 28 and the base portion 29 of the members 27. Incorporated in each of the presser members 67 is an electric heating element 71.

The mechanism associated with the presser members 67 is not completely shown in each case. As with the members 27, however, it will be understood that the presser members 67 are provided with similar operating mechanisms working in synchronism.

The operation of the apparatus is as follows:

The box 3 carrying the batch 1 of cigarettes already partially enclosed by the wrapper blank 2, as shown in Figure 1, is brought to rest by the chain 4 in the position shown in Figures 1 and 3. The members 27 are then moved towards each other between the upstanding lengths of the wrapper blank 2, by means of the rods 9 sliding in the tracks 11 under the action of the cams 21 co-operating with the cam rollers 19 in the arms 17, to the positions shown in Figure 4. In this position, the distance between the outermost portions of the longitudinal webs 28 is slightly greater than the width of the wrapper blank 2.

In order to ensure that the members 27 move into position on the batch 1 of cigarettes without damaging the cigarettes, the sliding members 13 carrying the members 27 are caused to lift slightly during the sliding movement of the rods 9 by reason of the connection of the sliding members 13 to the blocks 31 which are constrained to follow the tracks of the arms 32 of the bell crank levers 33, the tracks at this time being caused to incline upwardly towards each other under the action of the cams 38 co-operating with the cam rollers 37 of the arms 36. This upward movement of the sliding members 13 causes the members 27 to rise clear of the batch 1 of cigarettes during their movement towards each other. As the members 27 approach the end of their stroke the cams 38 cause the arms 32 to move into horizontal positions to bring the members 27 down on to the top of the batch 1 of cigarettes as shown in Figure 4. The members 27 are then caused to dwell, under the action of the cams 21 and 38, during which time the sliding members 52 are caused to move in their slides 51 towards each other by the rocking of the bell crank levers 54 under the action of the cams 59 co-operating with

the cam rollers 61 on the arms 62, to carry the presser members 67 into the angles between the webs 28 and the base portions 29.

During this movement of the presser members 67 their lower surfaces 69 move just clear of the upper surfaces of the base portions 29 and cause the upstanding lengths of the wrapper blank 2 to fold over so that intermediate portions of the blank lie along the upper surfaces of the base portions 29 and the end portions lie against opposite sides of the longitudinal webs 28, in the form of longitudinal flanges 76.

As the presser members 67 approach the end of their stroke, as shown in Figure 3, the mechanism controlling the members 27 again comes into operation to withdraw the members 27 along horizontal paths (the arms 32 of the bell crank lever 33 remaining horizontal during the withdrawal) until they are clear of the wrapper blank 2 as shown in Figure 2, the presser members 67 continuing their movement towards each other to press the longitudinal flanges 76 together to form a longitudinal seam 77, the flanges being secured together by adhesion resulting from the heating of the flanges by the heated surfaces 68 of the presser members 67. The presser members 67 are then withdrawn clear of the batch 1 under the action of the cams 59 and associated mechanism and the chain 4 is then caused to move to carry the box 3 with the wrapped batch 1 to a further stage in the machine, during which movement the longitudinal seam 77 is pressed down upon the upper surface of the wrapper by its contact with a presser member 67 (the right-hand member shown in Figures 1 and 3) as the box 3 passes beneath that member to the position shown in Figure 3. By the above operations, the wrapper blank 2 is formed into a rectangular tube enclosing the batch 1 of cigarettes on four sides and having a longitudinal seam formed in the middle of the upper surface of the tube. The batch 1 of cigarettes, wrapped in this manner, is then moved to a further stage in the machine where the ends of the tube are closed.

I claim:

1. Method of wrapping a batch of cigarettes or other articles, comprising folding a wrapper of paper, foil, or similar material of a width greater than the length of the article and of a length greater than the periphery of the article, about the bottom and two opposed sides of the article so as to leave a length of wrapper upstanding from each of said opposed sides, inserting a longitudinal web between the upstanding lengths of wrapper at the position where the seam is to be, pressing the said lengths into the angles between the web and the article in such a manner as to cause the said lengths to fold over so that intermediate portions of the wrapper lie along the upper surface of the article and the end portions lie against opposite sides of the longitudinal web in the form of longitudinal flanges, withdrawing the web from between the flanges, with the wrapper still held in the position into which it has been pressed, to allow the opposing faces of the flanges to be pressed together, and securing the flanges together by adhesive material to form a longitudinal seam upstanding from the article.

2. Method according to claim 1, wherein the wrapper is formed from heat-sealing material and the securing of the flanges is brought about by nipping the flanges together between a pair of heated surfaces.

3. Apparatus for wrapping a batch of cigarettes or other articles, comprising means for folding a wrapper about the bottom and two opposed sides of the article leaving a length of wrapper upstanding from each of said opposed sides of the article, a longitudinal web adapted to be moved into position on the article between the upstanding lengths of wrapper, means for pressing the said lengths into the angles between the web and the article in such a manner as to fold the said lengths over the article with their end portions lying against opposite sides of the web in the form of longitudinal flanges, means for withdrawing the web from between the flanges while the wrapper is held in position by the pressing means, and means for securing the flanges together by adhesive material to form a longitudinal seam upstanding from the article.

4. Apparatus according to claim 3, comprising means for folding the longitudinal seam down on to the wrapper.

5. Apparatus for wrapping a batch of cigarettes or other articles, comprising means for folding a wrapper about the bottom and two opposed sides of the article leaving a length of wrapper upstanding from each of said opposed sides of the article, a longitudinal web adapted to be moved into position on the article between the upstanding lengths of wrapper, a pair of presser members movable up to opposite sides of the longitudinal web and each having a cross-sectional shape which fits closely into the angle between the web and the article so as to fold the said lengths over the article with their end portions lying against opposite sides of the web in the form of longitudinal flanges, means for withdrawing the web from between the flanges while the wrapper is held in position by the presser members, and means for securing the flanges together by adhesive material to form a longitudinal seam upstanding from the article.

6. Apparatus according to claim 5, wherein the presser members comprise heating elements.

7. Apparatus according to claim 3, wherein the longitudinal web is made in two sections and means are provided for inserting the sections in alignment with each other between the upstanding lengths of wrapper one from each end of the article.

8. Apparatus according to claim 5, wherein the longitudinal web is made in two sections and means are provided for inserting the sections in alignment with each other between the upstanding lengths of wrapper one from each end of the article.

9. Apparatus according to claim 3, comprising a wrapper guiding member adapted to be moved into position on the article, between the article and the longitudinal web, with an edge lying substantially coincident with each longitudinal edge of the article on the side where the seam is to be formed, the pressing means being arranged to press the wrapper over the guiding member to enclose it temporarily with the article.

10. Apparatus according to claim 5, comprising a wrapper guiding member adapted to be moved into position on the article, between the article and the longitudinal web, with an edge lying substantially coincident with each longitudinal edge of the article on the side where the seam is to be formed, the pressing means being arranged to press the wrapper over the guiding member to enclose it temporarily with the article.

11. Apparatus for wrapping a batch of cigarettes or other articles, comprising means for folding a wrapper about the bottom and two

opposed sides of the article leaving a length of wrapper upstanding from each of said opposed sides of the article, a longitudinal web provided with a wrapper guiding member which forms with the web a member of inverted T-section, said T-section member being adapted to be moved into position on the article between the upstanding lengths of wrapper with an edge of the guiding member lying substantially coincident with each longitudinal edge of the article on the side where the seam is to be formed, means for pressing the said lengths into the angles between the web and the guiding member in such a manner as to fold said lengths over the guiding member with their end portions lying against opposite sides of the web in the form of longitudinal flanges, means for withdrawing the T-section member from the folded wrapper while the wrapper is held in position by the pressing means, and means for securing the flanges together by adhesive material to form a longitudinal seam upstanding from the article.

12. Apparatus according to claim 11, wherein the pressing means comprises a pair of presser members movable up to opposite sides of the longitudinal web, the presser members having a cross-sectional shape which fits closely into the angles between the web and the wrapper guiding member.

13. Apparatus according to claim 11, wherein the pressing means comprise heating elements.

14. Apparatus according to claim 11, wherein the T-section member is made in two sections and means are provided for inserting the sections in alignment with each other between the upstanding lengths of wrapper one from each end of the article.

15. Apparatus according to claim 3, wherein the longitudinal web is slidably mounted and cam means are provided for moving the web into and out of position on the article.

16. Apparatus according to claim 5, wherein the presser members are slidably mounted and cam means are provided for moving the presser members into and out of position adjacent the longitudinal web.

17. Apparatus for wrapping a batch of cigarettes or other articles, comprising means for folding a wrapper of heat-sealing material about the bottom and two opposed sides of the article leaving a length of wrapper upstanding from each of said opposed sides of the article, a pair of inverted T-section members adapted to be moved into position on the article in alignment with each other between the upstanding lengths of wrapper one from each end of the article, a pair of heated presser members movable up to opposite sides of the webs of the T-section members to press the said lengths of wrapper into the angles between said webs and the horizontal portions of the T-section members so as to fold the said lengths over said horizontal portions with the end portions of said lengths lying against opposite sides of the webs in the form of longitudinal flanges, said T-section members and said presser members being slidably mounted, and cam means for moving the T-section members and presser members into and out of position, said cam means being so arranged that the T-section members are withdrawn from the folded wrapper while the wrapper is held in position by the presser members and the presser members are then caused to make a further movement to nip the flanges together to cause adhesion between the flanges to form a longitudinal seam upstanding from the article.

ALFRED GERMAN ROSE.