

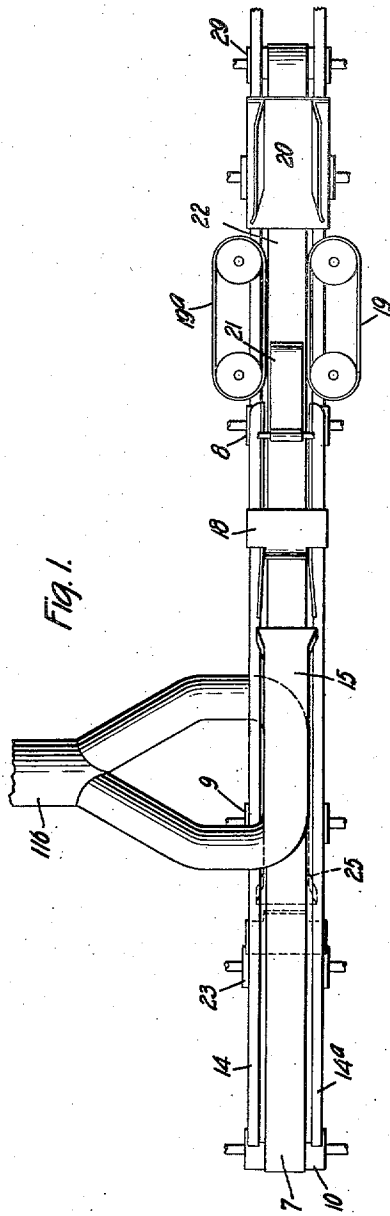
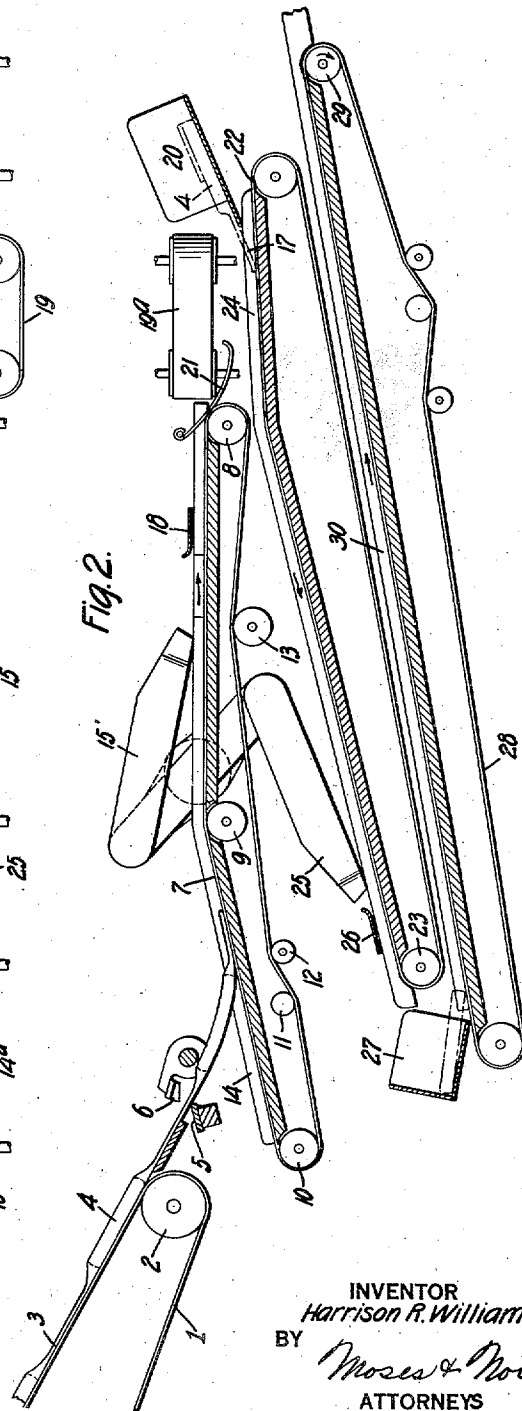
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H. R. WILLIAMS

1,973,737

METHOD AND APPARATUS FOR MAKING CATAMENIAL BANDAGES

Original Filed Jan. 12, 1929 2 Sheets-Sheet 1



INVENTOR
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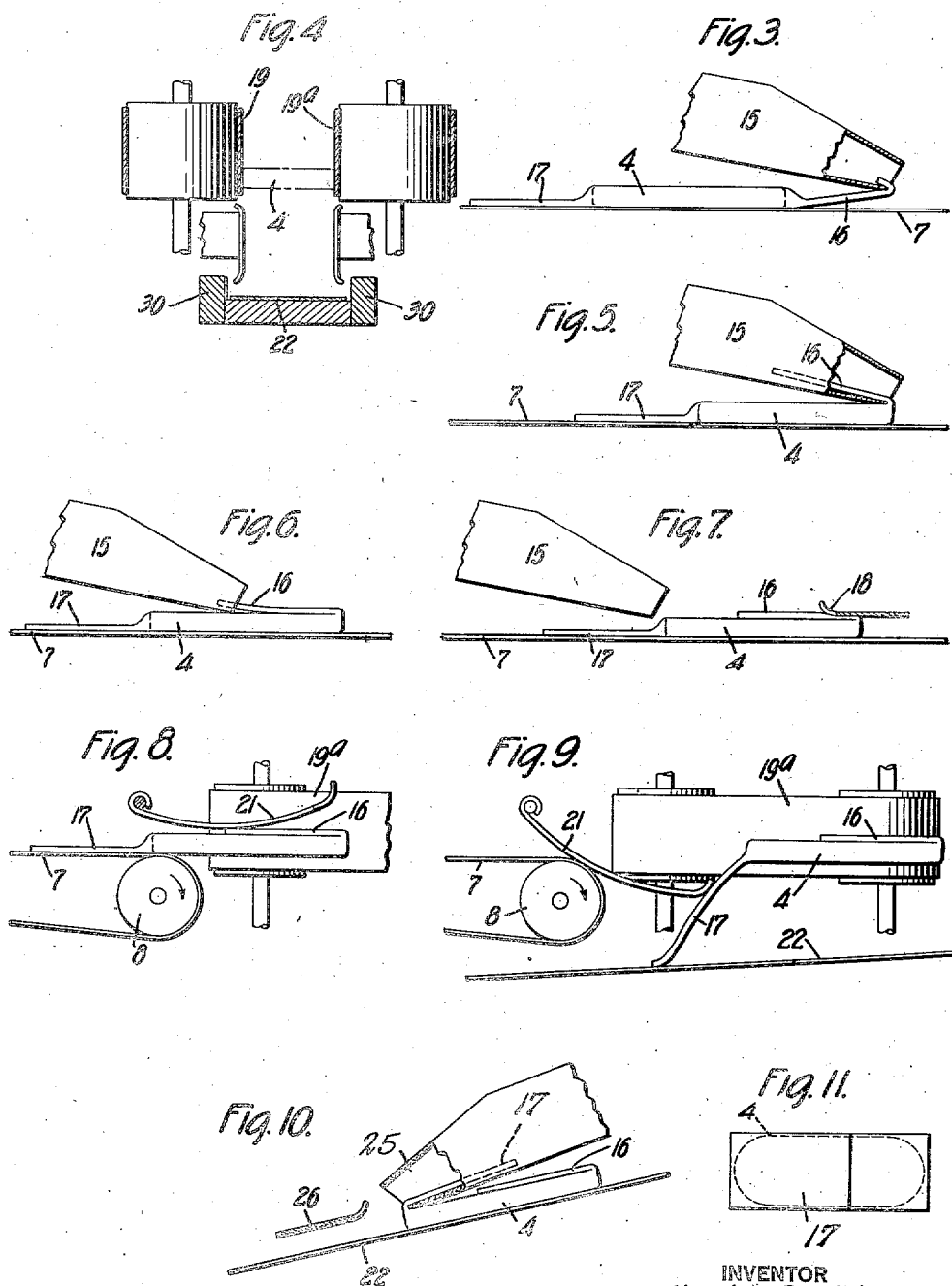
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METHOD AND APPARATUS FOR MAKING
CATAMENIAL BANDAGES

Harrison R. Williams, New York, N. Y.

Application January 12, 1929, Serial No. 332,051
Renewed April 18, 1933

30 Claims. (Cl. 223—15)

This invention relates to folding devices. Although capable of general use, it is particularly concerned with the manufacture of catamenial bandages of the character which consists of a pad of absorptive material, such as cellulose wadding or thin paper lamination, having a covering of cotton gauze or like material. During the course of manufacture the side edges of the gauze are folded longitudinally over the pads, and the present invention is concerned with the provision of improved methods of and means for folding over the tabs or end flaps of such bandages.

The invention will best be understood by reference to the accompanying drawings wherein are illustrated the various steps of the methods and means which may be employed in carrying out the same. In the drawings,

Fig. 1 is a top plan view of a portion of mechanism which may be employed for folding the covering about the pad.

Fig. 2 is a central longitudinal section of the folding mechanism shown in Fig. 1, and also of mechanism for feeding assembled bandage material, for cutting such material to length, and for delivering the thereby formed bandage assemblies to the aforesaid folding mechanism.

Fig. 3 is a fragmentary detail on an enlarged scale of one portion of the folding mechanism illustrated in Figs. 1 and 2, and shows a suction nozzle initially acting upon the leading flap of the bandage covering in order to carry out one of the folding steps of the method.

Fig. 4 is a fragmentary detail on an enlarged scale of another portion of the folding mechanism illustrated in Figs. 1 and 2, and shows a conveying device which may be employed in carrying out one of the steps of the method.

Fig. 5 is a fragmentary detail on an enlarged scale of the suction nozzle of Fig. 3, and shows the bandage assembly as it appears at the completion of the step illustrated as being initiated in Fig. 3.

Fig. 6 is a fragmentary detail on an enlarged scale showing the position of the bandage parts as the leading flap is being withdrawn out of the suction nozzle.

Fig. 7 is a fragmentary detail on an enlarged scale of another portion of the mechanism illustrated in Figs. 1 and 2, and comprising an ironing shoe for pressing down the leading flap of the bandage, and the form of the bandage when it has passed partly under said shoe.

Fig. 8 is a fragmentary detail on an enlarged scale of another portion of the mechanism illustrated in Figs. 1 and 2, and comprising a pivoted

plate for depressing the trailing flap of the bandage in the passage of the latter through the conveying device shown in Fig. 4.

Fig. 9 is a fragmentary detail on an enlarged scale illustrating the pivoted plate of Fig. 8 and showing the action thereof upon the trailing flap of the bandage.

Fig. 10 is a fragmentary detail, on an enlarged scale, of a suction nozzle similar to that of Fig. 3, for folding the trailing flap of the bandage covering, and an ironing shoe similar to that of Fig. 7, for pressing down such trailing flap.

Fig. 11 shows the completed bandage with the covering flaps folded and pressed down in accordance with the invention.

Like reference characters indicate like parts throughout the drawings.

Referring to the drawings (Fig. 2), a conveyor belt 1 (which may be actuated in any well-known manner, as by power applied to a pulley 2), advances a continuous strip of bandage covering, 3, having its sides folded over pads such as 4, to a shearing knife, comprising a stationary blade 5 and a rotating blade 6, which shearing device cuts the bandage covering between the pads. The thereby formed bandage assemblies fall by gravity upon the conveyor belt 7, which belt may be actuated in any well-known manner, as by power applied to the pulley 8. Conveyor belt 7 may be supported by idler pulleys, such as 9 and 10; and it may be maintained taut by means of tightener pulleys such as 11, 12 and 13. Side pieces 14 and 14a insure that the bandage assemblies will be retained upon the belt.

In the course of the travel of the bandage assembly, the leading flap 16 of the covering passes under the suction nozzle 15, which nozzle is connected by a conduit 116 (Fig. 1) to a vacuum pump (not shown). As appears from Fig. 1, this suction nozzle is provided with a flaring mouth to insure that the flap 16 will readily enter said nozzle. The initial action of the suction nozzle upon the flap 16 is illustrated in Fig. 3. As the bandage assembly is carried along by the conveyor belt 7, flap 16 continues to be drawn farther into the nozzle until it assumes the position shown in Fig. 5. The lower edge of the nozzle being square and relatively sharp, the suction insures a square folding of the leading flap 16.

The friction between the bandage covering and the conveyor belt 7 which is preferably of cotton is greater than the force of suction of the nozzle 15; and, as is indicated in Fig. 6, the movement of the belt therefore results in the progressive withdrawal of the leading flap 16 from the mouth

of the suction nozzle. The bandage assembly then passes under the ironing shoe 18 (Figs. 1, 2 and 7), causing the leading flap 16 to be pressed down upon the main body of the bandage covering. The covering being made of gauze or other light material, the parts thereof readily cohere and thereafter remain in position.

After having passed under the ironing shoe 18, the bandage assembly enters between vertical belts 19 and 19a (Figs. 1 and 4). These belts are so spaced from each other that the distance between their inner faces is slightly less than the width of the bandage assemblies, the pads of which are formed of light resilient material, in the present instance, cellulose wadding or thin laminations of paper. The bandage assemblies are supported by means of the friction between their edges and the inner surfaces of the belts, and are thus conveyed to the chute 20 (Figs. 1 and 2). The belts 19 and 19a have preferably a facing of rubber as distinguished from the cotton facing of belts 7, 22 and 28, so that the tendency of the gauze covering of the pads to adhere to said belts 19 and 19a is minimized. These belts moreover run at a slightly greater surface speed than conveyor belts 7, to help carry the pad by its momentum onto chute 20.

In passing from horizontal conveyor belt 7 to vertical conveyor belts 19—19a, the bandage assembly rides under the pivoted plate 21 (Figs. 1, 2, 8 and 9), which plate operates to depress the trailing flap 17 of the assembly, as illustrated in Fig. 9, in order that said trailing flap may with certainty pass from between the vertical belts 19—19a into contact with conveyor belt 22, which belt serves the purpose of straightening out the flap 17, preparatory to the folding thereof.

This chute (Figs. 1 and 2) is preferably made of polished metal, so that the assembly, upon delivery thereof to the chute by vertical conveyor belts 19—19a, readily slides under the influence of the pull on flap 17 by belt 22 onto the said belt. This latter belt may be actuated in any well-known manner, as by power applied to pulley 23, to move in a direction opposite to that of conveyor belt 7 and at the same speed as that of belts 19 and 19a. Side pieces 24 insure that the assembly shall remain on belt 22.

In its delivery from chute 20 to horizontal conveyor belt 22, the covering flap 17, which was originally the trailing flap, becomes the leading flap. In the movement of the assembly to the left as shown in Fig. 2, this flap 17 passes under suction nozzle 25 (Fig. 2), which nozzle, like nozzle 15, is connected through conduit 116 to the vacuum pump (not shown). Flap 17 is drawn into the nozzle, as shown in Fig. 10, a fold is effected therein, the flap is withdrawn from the nozzle by the movement of conveyor belt 22, and the assembly passes under an ironing shoe 26 (similar to ironing shoe 18), by which shoe 26 the flap 17 is pressed down upon the main body of the bandage covering.

After having passed under the ironing shoe 26, the folded bandage is delivered by conveyor belt 22 to hopper 27, from which it passes by gravity to conveyor belt 28, actuated in any well-known manner, as by power applied to pulley 29. Belt 28 is provided with side pieces such as 30 for insuring that the bandage shall remain on the belt. The completed bandage may be delivered by belt 28 to another conveyor belt (not shown), or directly to a packing table (not shown).

I have described what I believe to be the best embodiment of my invention. I do not wish,

however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. In wrapping wherein a covering is applied to a package, the improvement which consists in engaging the covering with the package employing a partial vacuum to hold a flap of the covering against movement in unison with the package, and bodily moving the package with the engaged portion of the covering, relative to the held flap, to produce a fold in said covering.

2. In wrapping wherein a covering is applied to a package, the improvement which consists in moving the package to progressively subject a flap of the covering to the suction of a partial vacuum in order to hold the flap, and progressively withdrawing the flap from such suction in order to produce a fold in said flap.

3. In wrapping wherein a covering is applied to a package, the improvement which consists in employing the suction of a partial vacuum to seize an end of a flap of the covering, moving the package and covering to subject a progressively increasing area of the flap to the effect of the suction, and moving the package and covering to progressively withdraw the flap from the effect of the suction in order to produce a fold in said flap.

4. In wrapping wherein a covering is applied to a package, the improvement which consists in employing a partial vacuum for holding a flap extremity of the covering, moving the package to draw the vacuum-held flap extremity into contact therewith, and pressing the flap upon the package.

5. The method of folding a flap of a package covering which consists in holding said flap by the suction effect of a partial vacuum and continuously bodily moving the package relative to the vacuum-held flap to bring the flap into contact with the package and pull it free of the holding means.

6. In package-wrapping apparatus, the combination of package-conveying means and a vacuum nozzle co-operative with said conveying means to produce a fold in a package wrapper.

7. In package-wrapping apparatus, the combination of package-conveying means, a vacuum nozzle co-operative with said conveying means to produce a fold in a flap of a package wrapper, and means for pressing said flap upon said package.

8. In package-wrapping apparatus, the combination of a vacuum nozzle for seizing a flap of a package wrapper, and means for feeding said flap into said nozzle and for withdrawing the same therefrom in order to effect a fold therein.

9. In package-wrapping apparatus, the combination of a horizontally-disposed conveyor belt for carrying a partially-wrapped package, a vacuum nozzle for holding the leading flap of the wrapper of said package and co-operative with said conveyor belt to effect a fold in said leading flap, a shoe co-operative with said conveyor belt to press said flap upon said package, a pivoted plate for depressing the trailing flap of said wrapper, a plurality of vertically-disposed conveyor belts for carrying said package, a receiver to which said last-named belts deliver said package, a second horizontally-disposed conveyor belt to which said receiver delivers said package, a vacuum nozzle for holding the unfolded flap of the wrapper and co-operative with said last conveyor belt to effect a fold in said flap, and a

shoe co-operative with said last conveyor belt to press said last-named flap upon said package.

10. In package-wrapping apparatus, the combination of means for moving a package, a vacuum nozzle co-operative with said package-moving means to produce a fold in a wrapper for said package, means for reversing the direction of travel of said package, and means for producing a second fold in said wrapper.

11. In package-wrapping apparatus, the combination of means for moving a package, a vacuum nozzle co-operative with said package-moving means for folding a flap of a wrapper for said package, means for reversing the direction of travel of said package, and means co-operative with said last-named package-moving means for folding a second flap of said wrapper.

12. In package-wrapping apparatus, the combination of means for moving a package, a vacuum nozzle co-operative with said package-moving means for folding one flap of a wrapper for said package, means for reversing the direction of movement of said package, and a second vacuum nozzle co-operative with said movement-reversing means for folding another flap of said wrapper.

13. In package-wrapping apparatus, a belt for conveying a partially-wrapped package, a suction nozzle co-operative with said belt to fold one flap of a wrapper for said package, a second conveyor belt moving in a direction opposite to that of the first conveyor belt, a second suction nozzle co-operative with said second conveyor belt to fold a second flap of said wrapper, and a third conveyor belt for delivering the wrapped package.

14. In the art of wrapping articles, the method which comprises applying a wrapping to an article with a flap portion of the wrapping extending in advance of the leading end of the article and then folding the flap through substantially two right angles by holding the leading end of the flap by suction while moving the leading end of the article toward and beyond the held end of the flap.

15. In the art of wrapping articles, the method which comprises applying a wrapping to an article with a flap portion of the wrapping extending in advance of the leading end of the article, feeding the article forward continuously, lifting the leading end of the flap by suction, and holding such end of the flap substantially against advance until it has been lapped onto the article by the continued advance of the latter.

16. In the art of wrapping articles, the method which comprises applying a wrapping of limp material to an article with a flap portion of the wrapping extending beyond the article, and then folding the flap adjacent the end thereof and causing the line of fold to progress inward toward the article until the line of fold lies adjacent the article.

17. In an article wrapping apparatus for turning into lapping relation to the article a flap portion of a wrapping applied thereto, in combination, means for holding an end portion of the flap by suction, and means for relatively moving the article and said flap holding means to lap the flap onto the article and for continuing the same relative movement to free the flap from the holding means.

18. In an article wrapping apparatus for turning into lapping relation to the article a flap portion of a limp wrapping applied thereto, in combination, means for continuously advancing the article, and means for picking up the leading end

of the flap and yieldingly holding it under tension and against advance until the article in the continued advance thereof passes beneath the flap and pulls it free.

19. An article wrapping mechanism for folding a wrapping flap of a partially wrapped article consisting of an article conveyor and a suction throat immediately thereabove adapted to swallow the flap and then yield it up under tension as the article is moved by the conveyor away from the throat.

20. An article wrapping mechanism for folding a wrapping flap of a partially wrapped article, comprising a continuous feed article conveyor, and stationary pneumatic flap holding means situated in proximity to the conveyor.

21. The method of enclosing an article in a wrapper of limp material, which comprises folding a limp wrapper about the article, advancing the article along a substantially fixed path with a flap portion of the wrapper extending in advance of the leading end of the article, diverting such flap portion to one side of said path under tension, and maintaining the flap under tension while continuing the advance of the article, until the leading end of the article, having passed the flap, acts to draw the flap forward under tension and into lapping relation to the article.

22. The method of folding over oppositely extending, substantially coplanar end flaps of a limp wrapper against an article enfolded in the wrapper, which comprises advancing the partially wrapped article endwise, supporting the leading flaps and folding it over through substantially a straight angle against the article during such advance, reversing the endwise travel of the article so that the opposite end leads, and supporting the flap at said opposite end and folding it over through substantially a straight angle against the article during such reversed endwise travel.

23. An apparatus for folding over oppositely extending, substantially coplanar flap portions of a limp wrapper against an article enfolded in the wrapper, which comprises means for advancing the partially wrapped article endwise, means for folding over the leading flap through substantially a straight angle against the article during such advance, means for reversing the endwise travel of the article so that the opposite end is caused to lead, and means for folding over the flap at said opposite end through substantially a straight angle against the article during such reversed endwise travel.

24. An apparatus for folding over the flap portions of a limp wrapper against an article enfolded in the wrapper, which comprises an upper conveyor for advancing the partially wrapped article endwise, means for folding over the leading flap against the article during such advance, a lower conveyor running in the reverse direction for moving the article in the reverse direction with the opposite end leading, means for folding the flap at said opposite end against the article during such reverse movement, and means for effecting transfer of the article from the upper conveyor to the lower conveyor.

25. An apparatus for folding over the flap portions of a limp wrapper against an article enfolded in the wrapper which comprises a pair of stationary folding devices, each adapted to fold a leading flap back onto the article, and means for feeding the article to and beyond one of the folding devices with one flap leading and then through a different path to and beyond the other

of the folding devices with the other flap leading.

26. An apparatus for folding over the flap portions of a limp wrapper against an article enfolded in the wrapper which comprises a pair of folding devices, each adapted to fold a leading flap back onto the article, and means for feeding the article to and beyond one of the folding devices with one flap leading and then through a different path to and beyond the other of the folding devices with the other flap leading.

27. An apparatus for folding over the flap portions of a limp wrapper against an article enfolded in the wrapper which comprises a pair of folding devices, each adapted to fold a leading flap of the article, and means for feeding an article successfully through distinct paths to and beyond each of said folding devices including means for effecting an end for end reversal of the article travel between the folding devices.

28. In an apparatus for folding over the flap portions of a limp wrapper against an article partially enfolded in the wrapper, in combination, a pair of successive unidirectional feeders, one for advancing the article with one flap leading and the other for advancing the article with the other flap leading, a folding device associated with the first feeder for laying over onto the article the flap which leads as the article is advanced by the first feeder and a second folding device associated with the second feeder for laying over onto the article the flap which leads as the article is advanced by the second feeder.

29. The method of wrapping a partially wrapped article with limp material which comprises advancing the article longitudinally in the plane of its body with a leading end flap substantially in the plane of the body, deflecting said end flap from the body path while continuing the advance of the body until the end flap is completely displaced from the body path, then causing a retarding pull to be exerted upon the end of said end flap remote from the body and while causing such retarding pull to be exerted, causing the body, by its continued advance, to pull the end flap forward under light tension until the end flap is lapped smoothly against the body.

30. In wrapping apparatus, means for advancing a body longitudinally in the plane of its body with a portion of a limp wrapper leading and substantially in the plane of the body, means defining a path of movement for said wrapper portion, said means being disposed at an acute angle converging with the direction of advance in the path described by the body in its movement, means for moving said leading wrapper portion into said path and causing a retarding pull thereon, and means producing relative movement between said path-defining means and said body to withdraw said projecting wrapper portion from said path and fold it under tension smoothly against said body.

HARRISON R. WILLIAMS.

CERTIFICATE OF CORRECTION.

Patent No. 1,973,737.

September 18, 1934.

HARRISON R. WILLIAMS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, line 16, for "successfully" read successively; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of October, A. D. 1934.

Leslie Frazer

Acting Commissioner of Patents.

(Seal)

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26. An apparatus for folding over the flap portions of a limp wrapper against an article enfolded in the wrapper which comprises a pair of folding devices, each adapted to fold a leading flap back onto the article, and means for feeding the article to and beyond one of the folding devices with one flap leading and then through a different path to and beyond the other of the folding devices with the other flap leading.

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