L. W. LUELLEN.

PACKAGE FORMING MACHINE.

APPLICATION FILED DEC. 15, 1913.

1,194,045.

Patented Aug. 8, 1916.

3 SHEETS—SHEET 1.

Fig. 1.

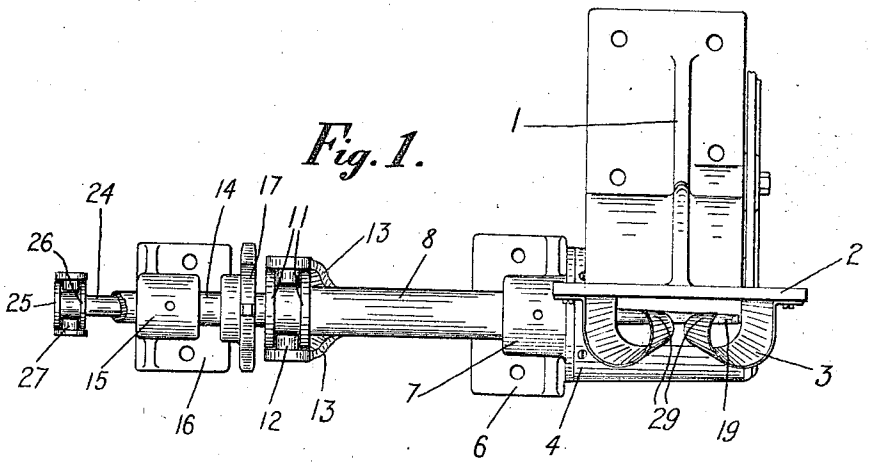


Fig. 5.

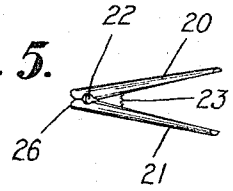


Fig. 2.

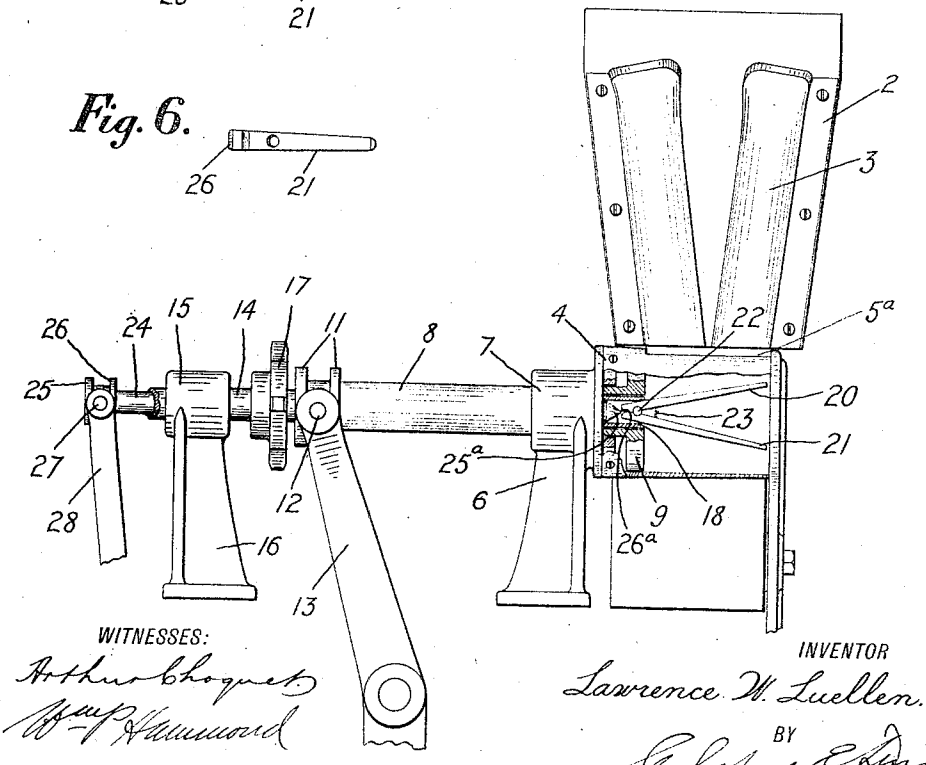


Fig. 6.

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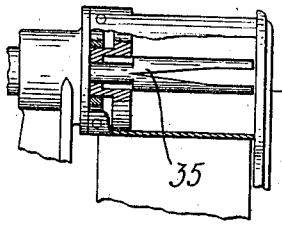


Fig. 12.

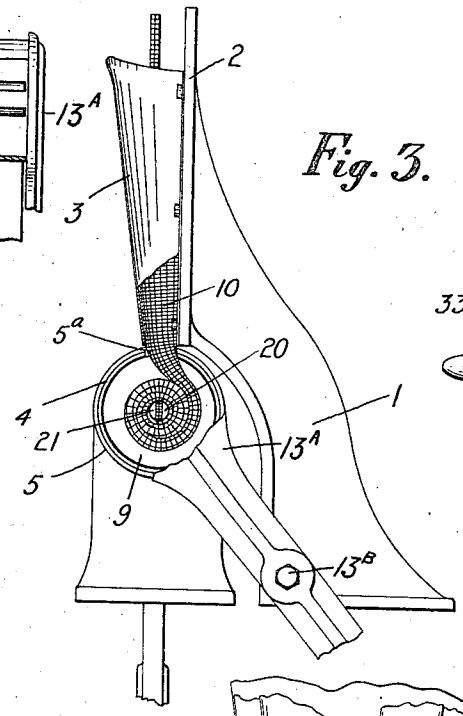


Fig. 3.

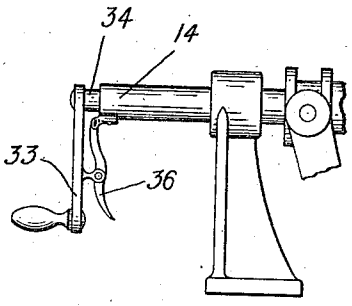


Fig. 13.

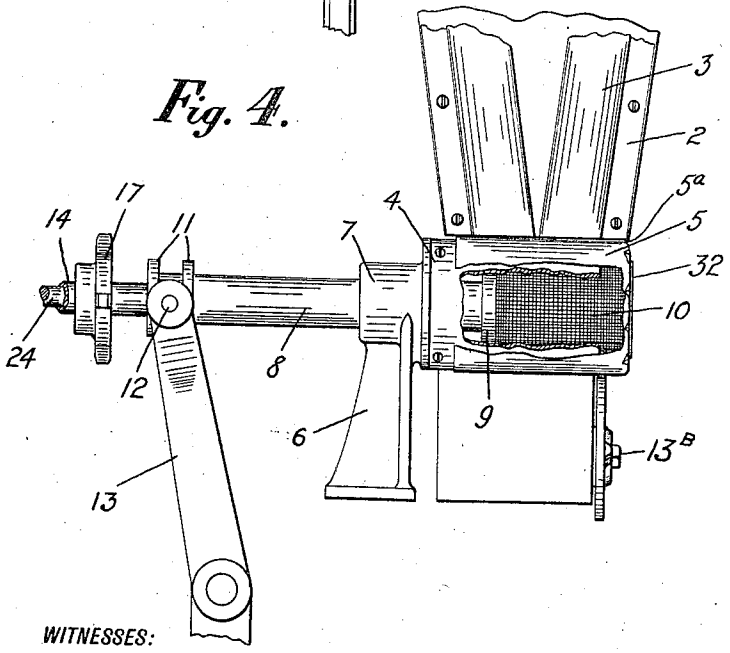


Fig. 4.

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3 SHEETS—SHEET 3.

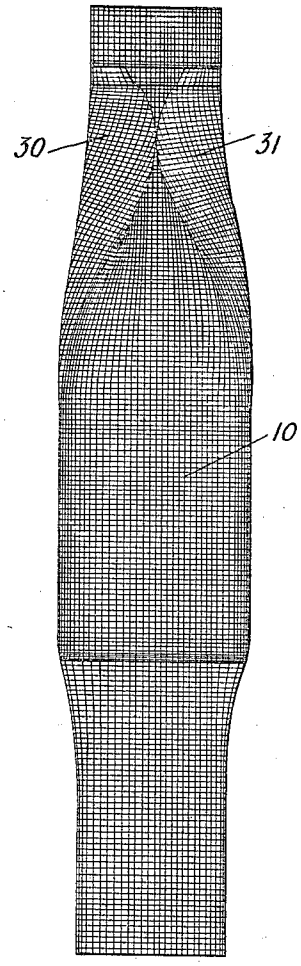


Fig. 7.

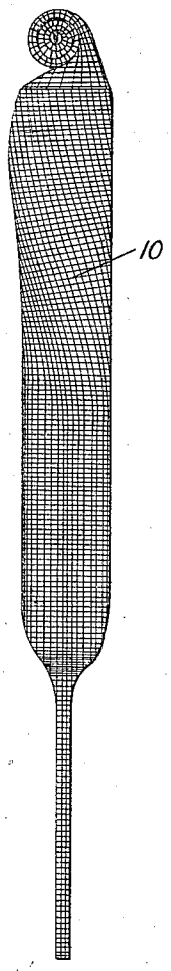


Fig. 8.

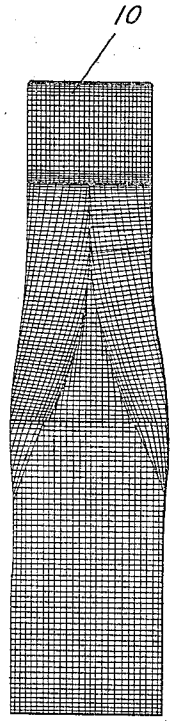


Fig. 9.

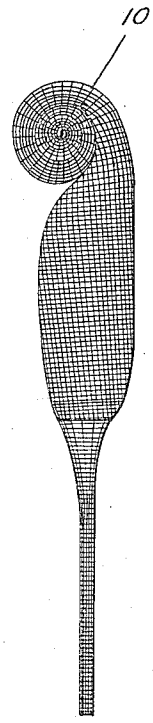


Fig. 10.

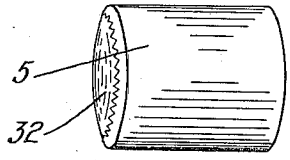


Fig. 11.

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UNITED STATES PATENT OFFICE.

LAWRENCE W. LUELLEN, OF MOUNTAIN LAKES, NEW JERSEY, ASSIGNOR TO INDIVIDUAL DRINKING CUP COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

PACKAGE-FORMING MACHINE.

1,194,045. Specification of Letters Patent. Patented Aug. 8, 1916.

Application filed December 15, 1913. Serial No. 806,823.

To all whom it may concern:

Be it known that I, LAWRENCE W. LUELLEN, a citizen of the United States, residing in Mountain Lakes, county of Morris, and State of New Jersey, have invented certain new and useful Improvements in Package-Forming Machines, of which the following, taken in connection with the accompanying sheets of drawings, is a full, clear, and concise description.

My invention relates to improvements in package forming machines.

More specifically my invention comprehends a mechanism, which will cause substantially flat rectangular shaped bandages to be rolled and compressed into a cylindrical package form and be delivered therefrom wrapped within a covering of paper or the like for distribution through automatic dispensing machines.

My invention furthermore comprehends certain details of mechanism, which will impart to the bandage, when removed from its package, a substantial trough-like formation.

These and other novel features of my invention will be more fully disclosed in the following specification and set forth in the appended claims.

Referring to the accompanying drawings, in which I have shown one preferable embodiment of my invention, Figure 1 is a top plan view of a package forming machine, including the novel features of my invention. Fig. 2 is a view thereof in side elevation partly in section. Fig. 3 is a view in side elevation partly in section. Fig. 4 is a detail view somewhat similar to Fig. 2 showing the package delivery mechanism in operation. Figs. 5 and 6 are side and top plan views respectively, of the winding mandrel. Figs. 7, 8, 9, and 10 are details of the bandage in different positions or stages of packing. Fig. 11 shows the completed package. Fig. 12 is a detail of a modification showing a one-piece wrapper spindle having fixed jaws. Fig. 13 is a detail showing a modified form of hand-operated mechanism for imparting rotary movement to the wrapper spindle and reciprocal movement to the package ejector.

In carrying my invention into practice, I employ a suitable standard 1, carrying a face plate 2, to which is attached forming guides of trough-like formation 3. Beneath these guides and in proximity to the standard 1, I arrange a winding mechanism, which includes a suitable cylindrical drum or housing 4, spaced from the face plate 2, and the ends of the forming guides 3, so as to permit its envelopment with the package wrapper 5, preparatory to the delivery of the package. This drum 4 is provided with a slot 5^a to permit the entry therein of the article to be wound and packed. The drum 4 is supported by a standard 6 at the end of a plunger support 7, through which a plunger 8 reciprocates and causes the wrapped article to be ejected from the drum incased within a wrapper. This plunger 8 carries at one end an enlargement or head 9, substantially the diameter of the interior of the drum 4 and engages one end of the wrapped article 10, (shown more clearly in Fig. 4) to eject it from the device as explained, the wrapper 5 having been first placed or slipped over the drum 4. Suitable automatic operating mechanism is provided to accomplish this ejection and I have shown as an example at one end of the plunger 8, a pair of collars 11 between which project a pair of pins or studs 12 carried at the end of a bifurcated arm 13. Reciprocal motion is imparted to this arm at the right interval of time after the article has become completely wound upon the winding spindle. To prevent the article from being dislodged during the winding thereof an end plate or closure 13^A pivoted at 13^B is employed, the same being arranged to be swung into and out of alinement with the open end of the drum 4.

In order to obtain rotary motion required to wrap the article, I arrange within the plunger 8 a tube spindle 14, journaled and supported in the bearing 15 of the standard 16. Keyed to this spindle 14, is a sprocket 17 driven by a suitable chain (not shown). The opposite end of this spindle projects within the housing or drum 4 and is slightly chamfered as at 18. This end accommodates the split spindle 19, which is adapted to automatically grasp and hold firmly the end of the article preparatory to its being wound thereon. This spindle consists of coinciding sections 20 and 21, pivoted at 22 and normally held in separated position by a spring 23. In order to close these jaws against the tension of the spring 23, to grasp the end of the article, I arrange a plunger

24, which reciprocates within the spindle 14, suitable mechanism similar to the mechanism described in connection with the ejecting mechanism being employed for this purpose, that is, by means of collars 25 and 26 with pins 27 and bifurcated arm 28 associated at the end of the plunger 24. The inner end of the plunger 24 is cone-shaped as at 25ª, and engages one end of the jaws of the spindle, these being curved at 26ª to coincide with end 25ª of the plunger. The guides 3 are trough shaped with curved ends 29 diverging inwardly in opposite direction, these ends act upon the edged portions of the article during its passage through the mechanism, so that the article is somewhat folded and compressed into a more compact form than that in which it is before it enters.

In Fig. 3, I have illustrated the mechanism in conjunction with the folding and packing of a catamenial bandage, which has partly been wound, several laminated windings having taken place upon the spindle. The condition of the bandage at this state of winding is more clearly shown in Figs. 7 and 8, where it will be seen that the side edges 30 and 31 have been folded over by the curved forming guides 3. Fig. 7 shows the relative dimensions of the article before and after wrapping, the wrapped end being considerably narrower than the unwrapped end. Continued wrapping by the mechanism shapes the article as shown in Figs. 9 and 10, until finally when the article has been entirely wrapped around the spindle 19, it assumes the condition shown in Fig. 4, whereupon the wrapper 5 having a closed end 32 is placed over the drum 4. The ejecting mechanism then comes into operation, the plunger 9 engaging and ejecting the article and wrapper from its mechanism after which the open end of the wrapper is closed and the article is then in its finished condition, as shown in Fig. 11.

Instead of operating the mechanism by electrical power, or otherwise automatically, I may operate the same by hand. In order to accomplish this, I have shown in Fig. 13, a crank 33 mounted upon a spindle 34, which does not reciprocate like the spindle 24, shown in Figs. 1 to 4 inclusive. The crank upon rotation imparts the winding movement to the split spindle 19. I may, if desired, form at the end of the spindle 34, integral jaws 35, between which the end of the article to be wrapped may be placed, after which, a slight rotary movement will suffice to produce the necessary grip to cause the article to be fully wound thereon. In order to eject the wrapped article when the device is hand-operated, I mount a hand lever 36, upon the crank 33, which lever is attached to the ejector. By rocking this hand lever 36, the necessary projecting movement is obtained to eject the package from the drum.

While an embodiment of my invention is shown and described in connection with the wrapping and packing of catamenial bandages, it is manifest that it is equally adapted to wrap and pack other articles, although to the accomplishment of which slight modifications may be required in the structural arrangement of its parts. The illustrated mechanism as explained when operating upon a bandage not only compresses and packs it into a relatively small package, but in the packing imparts a peculiar desired trough-like shape to it, which it assumes upon being removed from its wrapper.

Having thus described and ascertained the nature of my invention what I claim as new herein and desire to secure by Letters Patent is:

1. A package forming mechanism including in combination shaping and winding mechanism operating to wrap into package form a substantially rectangular flexible article, said shaping and winding mechanism including a pair of curved guides, a cylindrical wrapper holder adjacent the discharged end of the guides, a winding spindle rotatably mounted within the cylindrical wrapper holder and means for imparting rotary movement to said winding spindle.

2. A package forming mechanism including in combination a pair of trough-like guide members, a wrapper holder at the discharge end of the guide member, a clamping spindle located within the holder and adapted to clamp the end of a flexible article and wind the same thereon, means for automatically operating said clamping spindle, and means for rotating the spindle to wind the article thereon.

3. A package forming and wrapping mechanism comprising in combination a pair of trough-like guides adapted to accommodate and shape an article passing therethrough, a bi-sected clamping spindle adapted to engage the end of the article and wind the same thereon, mechanism for rotating said spindle, and ejecting mechanism for removing said article from said spindle when completely wound.

4. A package forming mechanism including in combination a pair of trough-like guide members, a clamping spindle adapted to clamp the end of a flexible article and wind the same thereon, means for automatically operating said clamping spindle, means for rotating the spindle to wind the article thereon, and means for removing said article from the spindle when completely wound.

5. A package forming mechanism comprising a pair of trough-like forming guides, a drum juxtaposed to the discharge end of said guides, said drum being provided with

a slot to permit the passing of the article from the guides to the interior of the drum and to support a wrapper after the article has become completely wound, a clamping spindle rotatably mounted within said drum, means for operating said clamping spindle to cause the same to engage and clamp the end of the article, said clamping spindle automatically operating to release the end of the article when the latter is completely wound, and means for automatically ejecting the wound article and wrapper from the drum.

6. A wrapping and package forming mechanism comprising a pair of trough-like forming guides, a winding mechanism including an automatically operated clamping spindle around which the article is wound, and ejecting mechanism operating to remove the wound article from the spindle in package form.

7. A wrapping and package forming mechanism comprising a pair of trough-like forming guides, a drum provided with a slot juxtaposed to the discharge end of the forming guides to permit the passage of the article from the forming guides to the interior of the drum, a clamping spindle centrally disposed within said drum adapted to clamp the end of the article and wind the same thereon, means for imparting rotary movement to the clamping spindle, said means comprising a hollow spindle journaled and projecting into the housing and engaging the clamping spindle, means for rotating the hollow spindle, a reciprocating plunger within said hollow spindle adapted to engage and operate the clamping spindle, ejecting mechanism for removing the wound article from the clamping spindle, said ejecting mechanism including a plunger provided with a hollow stem surrounding the hollow spindle and means for imparting reciprocal motion to said plunger.

8. A package forming and wrapping mechanism comprising in combination a pair of guides adapted to shape as article passing therethrough, a hand operated winding mechanism including a gripping member for gripping the end of the flexible article to be wound thereon, and hand-operated ejecting mechanism for discharging said article longitudinally of the winding mechanism when completely wound.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LAWRENCE W. LUELLEN.

Witnesses:
P. FRANK SONNEK,
LILLIAN L. MALZER.