W. DICHMANN.

MACHINE FOR FORMING CONICAL NECKED WRAPPERS.

APPLICATION FILED JUNE 28, 1912.

1,039,108.

Patented Sept. 24, 1912.

3 SHEETS—SHEET 1.

Fig. 1.

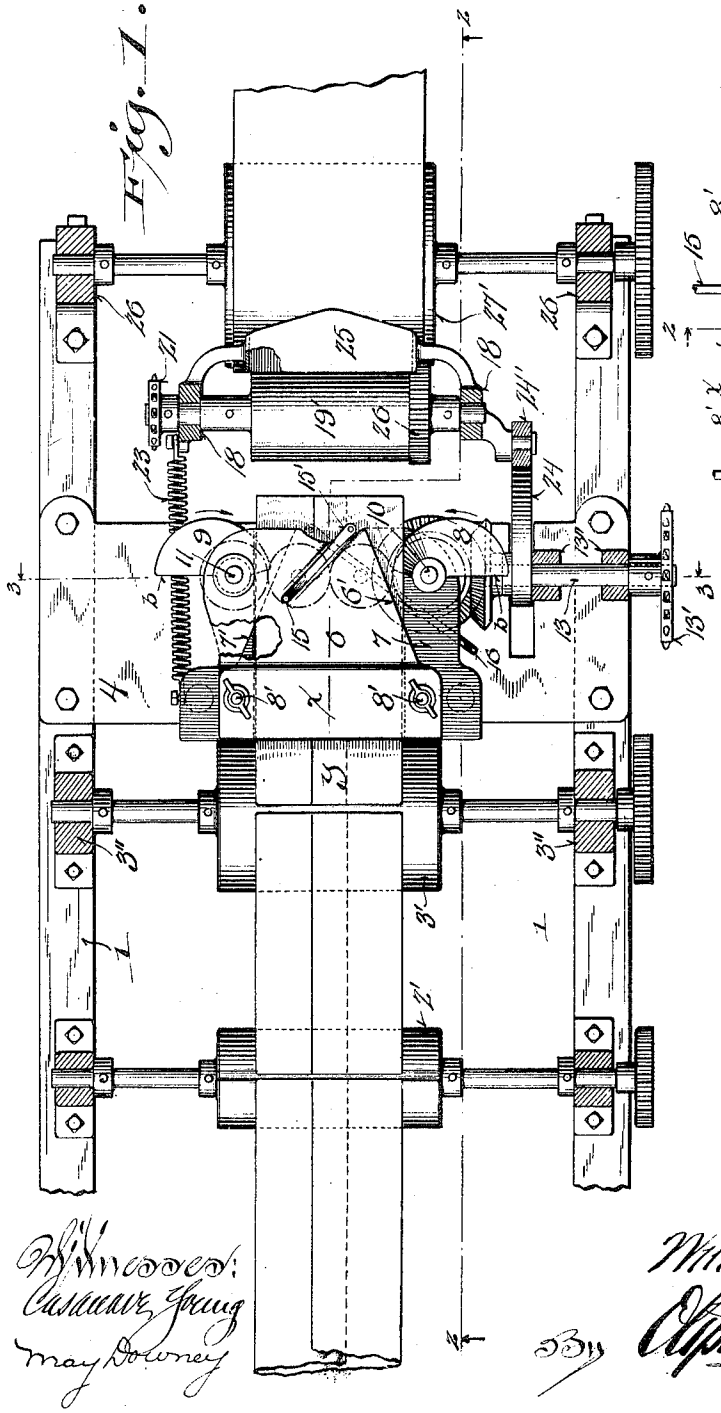
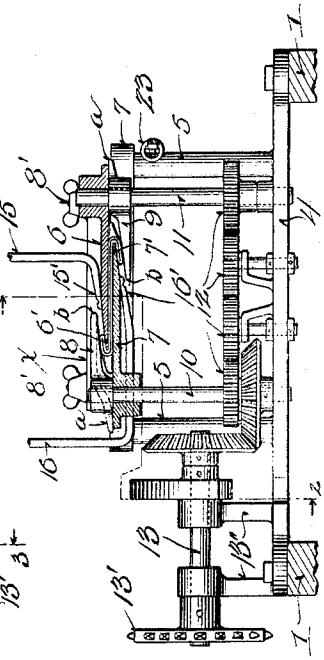


Fig. 3.



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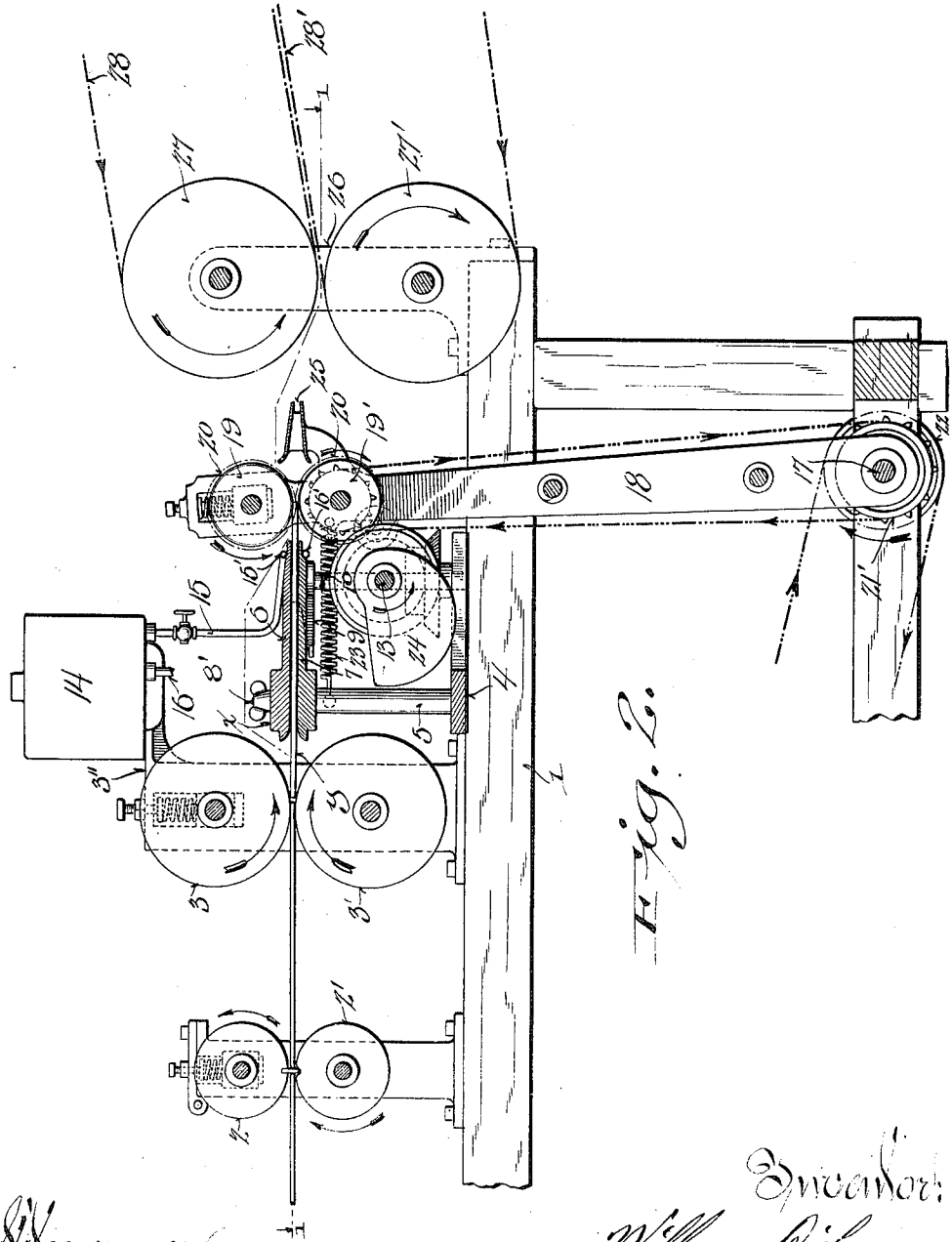

Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 1.

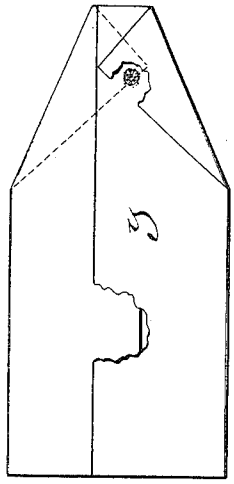


Fig. 5.

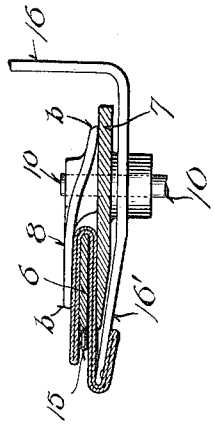


Fig. 4.

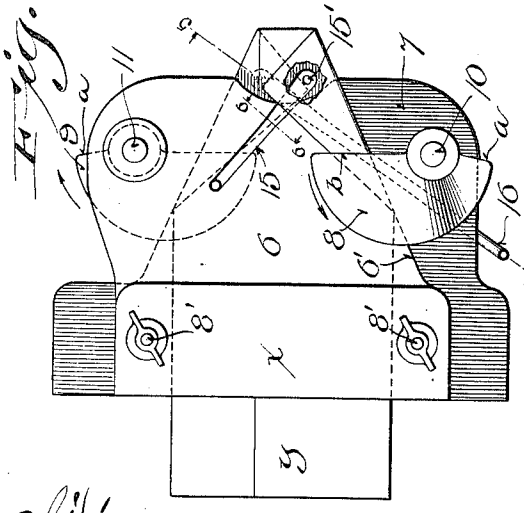
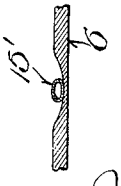


Fig. 6.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR FORMING CONICAL-NECKED WRAPPERS.

1,039,108. Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed June 28, 1912. Serial No. 706,436.

To all whom it may concern:

Be it known that I, WILLIAM DICHMANN, a citizen of the United States, and resident of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Machines for Forming Conical-Necked Wrappers; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention refers to bottle-wrapping machines for example of that type patented by me March 21, 1911, No. 987,440, the object being to provide simple, economical and effective means for forming conical necks upon tubular wrappers.

The machine above referred to was designed for forming wrappers from a continuous strip having a filler therebetween and with the exception of the filler, the wrappers to which my present invention is applied are similar.

The construction and arrangement of my present invention is such that the flattened hollow tubular blanks are fed through a forming throat having upper and lower oblique templet edges, over which edges the mouth corners of the flat blank are simultaneously folded in opposite directions and creased in triangular sections. This folding operation is accomplished by upper and lower wiper wings, the same effecting said fold upon opposite faces of the blank co-incident to the folding operation. The inner faces or tips of said triangular folded sections, are each pressed upon a flat nipple, whereby adhesive fluid is inserted upon the inner face of each triangular fold, causing the latter to adhere to the body of the blank. The blank after receiving the conical neck-fold just described is gripped between driven snapping rolls that vibrate between the lips of the forming throat and a receiver, whereby said blanks are thoroughly creased as they travel between the snapping rolls and are discharged into the receiver, which receiver may comprise a pair of corrugating rolls or endless belts as shown, all of the parts being driven by entrained gears, to effect the operation in successive steps.

With the above object in view the invention consists in certain peculiarities of construction and combination of parts as set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents a plan view of the discharge end of a wrapper-forming machine embodying the features of my invention, parts being broken away and parts in section to more clearly show certain structural features, the section being indicated by line 1—1 of Fig. 2; Fig. 2, a longitudinal sectional elevation of the same, the section being indicated by lines 2—2 of Figs. 1 and 3; Fig. 3, a detailed cross-section illustrating the means for effecting the conical fold upon the wrapper mouth, the section being indicated by line 3—3 of Fig. 1; Fig. 4, a detailed plan view of the folding mechanism showing the wrapper in its folded position within the forming throat; Fig. 5, a detailed cross-section of the wrapper neck-forming mechanism, the section being indicated by line 5—5 of Fig. 4; Fig. 6, another detailed cross-section showing the position of one of the adhesive supply tubes with relation to the adjacent face of the forming throat, and Fig. 7, a detailed plan view of a wrapper having a conical neck thereon completed in accordance with my invention.

Referring by characters to the drawings 1, 1, represent fragments of the upper structures of a frame, which frame comprises the discharge end of a pad-making machine such as referred to. In my present invention, as previously stated, the wrapper tube is formed in the same manner as in my previous patent, with the exception that the filler is dispensed with and the tubes are passed between compression rolls and flattened prior to being delivered between cutting rolls 2, 2′, one of which cutting rolls, as shown, carries a blade that is adapted to enter a slot in the opposite roll whereby the blank is cut into lengths. These rolls are mounted in suitable bearing blocks with which the frame is provided. Set forwardly of the cutting rolls at a distance approximately equal to the length of the wrapper blank, is a pair of driven feed rolls 3, 3′, which rolls are also mounted in bearing brackets 3″ that extend from the upper frame stretches 1, 1.

A transversely arranged bed-plate 4 connects the upper frame members having posts

5 that support a feed-throat x, comprising upper and lower plates 6 and 7 respectively, the inner faces of which plates are slightly channeled to form a passageway therebetween. The tubular wrappers are pushed into this feed-throat by means of the feed rolls, the said wrappers being delayed in their forward travel momentarily, during the operation of folding the mouth corners of said wrappers, whereby the conical necks are completed. The upper throat-plate 6 is clamped into position upon the lower plate 7 by screws 8′ that project from said lower plate through apertures in the upper plate, the said screws being engaged by thumb-nuts. The upper plate 6 is provided with an obliquely disposed edge 6′ that inclines forwardly to the terminal or discharge mouth of the throat, the inclination being in the direction of travel of the wrapper. The lower plate 7 has a similar oblique edge 7′, which edge together with the upper oblique edge form a conical templet over which the opposite flat mouth corners of the wrapper blank are folded triangularly in opposite directions.

The means for folding the blank corners consists of upper and lower rotary wiper wings 8, 9, respectively, the same being affixed to vertically disposed arbors 10, 11, respectively, that are stepped into the bed-plate 4. The arbor 10, which carries the upper wiper wing, projects through a hub that depends from the lower throat-plate 7 and the arbor 11 extends into a hub formed in the upper plate 6′ and carries the lower wing 9. Thus the lower wing co-acts with the lower throat-plate templet edge, to form one of the triangular corner folds of the wrapper blank and the upper wing in a similar manner co-acts with the upper plate edge to form the opposite triangular fold, the said wiper wings operating simultaneously. The wiper wings 8 and 9 each comprise segments of a spiral flight that start with low or knife-like lifting edges a, which lifting edges merge by gentle curves into upper folding edges b, the latter overlapping the oblique edges of the plates in their rotation, whereby the corners of the wrapper blanks are folded and pressed down succeeding a lift of said corners by the knife edges a, it being understood that the knife-edge a revolve upon the adjacent faces of the plates whereby the blank is caused to ride thereover as it is fed into the throat. The wiper-wing arbors are driven in opposite directions and in a reverse direction from the feed of the wrapper blank, by a gear-train 12, the arbor 10 being in turn driven by a miter gear connection from a drive shaft 13 that receives its motion from any source by an endless chain (not shown) that engages a sprocket-wheel 13′. The drive-shaft 13 is mounted in bearing-arms 13″ that extend upwardly from the bed-plate 4.

An inclosed glue-tank 14 is supported above the throat-plate upon a suitable bracket that forms part of the roll bracket 3″. This tank has extending therefrom a pair of valve-controlled feed-pipes 15, 16, that terminate with slightly flattened and apertured discharge nozzles 15′ and 16′ respectively, which nozzles are seated in depressions in the upper and lower throat-plates 6, 7, their ends being slightly extended beyond said plates. The upper nozzle 15′ is arranged to distribute a drop of liquid adhesive to the under side of the upper triangular corner fold of the wrapper and the lower nozzle likewise feeds adhesive liquid to the corresponding triangular fold. The glue-tank 14 is, as stated, hermetically sealed from above the body of the adhesive liquid for the purpose of subjecting said liquid to air pressure whereby it will be forced through the nipple apertures in order to effectively insure the feed of said liquid, it being preferable to utilize a solution of silicate of soda for the gluing liquid, due to the fact that said liquid in practice has been found to be highly efficient, while at the same time heating apparatus for the glue-pot or reservoir is dispensed with.

Mounted in suitable journals with which the machine frame is provided and beneath the throat-plate, is a transversely disposed shaft 17, upon which shaft is loosely fitted the arms 18 of an oscillatory frame. The upper free ends of the frame-arms carry a pair of upper and lower snapping rolls 19, 19′, respectively, each of which snapping rolls are provided at one end with a toothed gear-wheel 20 that are in meshing engagement, whereby motion is imparted to the upper snapping roll. The trunnion of the lower snapping roll carries a sprocket-wheel 21 that is in link-belt connection with a larger sprocket-wheel 21′, which latter sprocket-wheel is mounted upon the transverse shaft 17, the said shaft being driven by a pulley 22 that is belted to any suitable source of power. As best shown in Fig. 2, the oscillatory frame which carries the snapping rolls is illustrated in a rearward position assumed co-incident with engagement of the snapping rolls with the mouth of a wrapper y that has been formed with a conical neck, in which position the frame is held by a coiled spring 23 that connects said frame and one of the posts 5. Oscillatory movement of the frame in the opposite direction is had through a cam 24, which cam is mounted upon the drive-shaft and is adapted to engage an anti-friction roller that is carried by one of the frame members 18. Hence it will be seen that the oscillatory snapping rolls are

constantly being driven as they move rearwardly toward the discharge mouth of the forming throat under spring pressure or forward by the cam in opposition to said spring.

At the discharge face of the snapping rolls there is provided a wrapper guide funnel 25, which funnel is supported by suitable arms that connect the frame-members. Mounted in standards 26 that project from the frame stretches 1 are a pair of receiving rolls 27, 27′, which are driven by a suitable gear connection. These rolls may constitute compression rolls between which the finished wrappers are passed to more firmly fold and set the same incidental to their delivery to a hopper and they may be corrugated in any suitable manner, whereby the wrappers are corrugated co-incident to their travel, such corrugations being utilized to add rigidity and resiliency to the wrappers. The receiving rollers, as shown, are provided with endless plates 28, 28′, between which the wrappers are arranged to travel whereby they will be thoroughly dried out, if desired, before delivery into a hopper or other receptacle for packing, it being understood however that the receiving-mechanism forms no part of my present invention.

In the operation of forming a conical neck upon the tubular wrapper blanks, it is apparent from the foregoing description that as the wrapper blanks are thrust into the forming throat, they will intermittently rest therein, due to the fact that they are discharged from between the feed rollers 3, 3′. As the wrapper-blanks assume the position shown in Fig. 1, the lifting edges *a* of the wiper wings enter between the respective upper and lower throat plates and the opposite faces of said wrapper blanks. As the wiper wings travel in the direction indicated by the arrows, they will gradually lift the mouth corners or crease the same along the lines of the templet edges of the throat plates and as the corners are folded over upon the oblique edges the upper or folding edges *b* of the wings will travel over the folded or triangular sections and thus bind the same down upon the plates 6 and 7 whereby the mouth corners of the wrapper are creased in alinement with the templet edges of the throat plates and co-incident to this folding operation, as the wings rotate, the inner faces of the triangular folded sections will be pressed down upon the nozzle apertures that contain a globule of adhesive fluid, which fluid will be distributed to the adjacent surface of the fold. Thus it will be understood that the wrapper has simultaneously received an upper fold at one edge and a lower downturned fold at the other edge and the cam 24 will at this time permit the snapping rollers to assume their rearward position as shown in Fig. 2, whereby the wrapper, with its completed conical neck, will be caught between the snapping rolls and withdrawn from the forming throat, co-incident with a forward movement of said snapping rolls, caused by rotation of cam 24. Thus the wrapper will be withdrawn from the forming throat and as the snapping rolls travel toward the receiving rolls the said wrapper will be fed between said snapping rolls and the triangular folds are pressed down securely, whereby the adhesive fluid will cause said triangular folds to adhere to the adjacent face of the wrapper. As the snapping rolls reach the limit of their forward movement, the completed wrapper will have protruded beyond the mouth of the funnel 25 whereby the edge of said wrapper will be engaged by the receiving rolls 27, 27′, and through their movement said wrapper will be stripped from the snapping rolls, which snapping rolls will then return to the position shown in Fig. 1 preparatory to receiving the next completed wrapper. From the foregoing description it is apparent that the operation can be effected at a maximum speed and that the conical necks of the completed wrappers will be uniform, particular attention being called to the fact that with each complete revolution of the wiper wings a wrapper is completed.

I claim:—

1. A machine for forming conical necks upon flat tubular wrappers comprising a feed-throat having an upper oblique edge and a lower oblique edge, said edges being upon opposite sides of the throat and converging in the direction of feed, upper and lower wiper wings arranged to simultaneously fold the mouth corners of the tubular blanks inwardly upon the oblique throat edges, adhesive delivery means adapted to discharge between the inner face of the folded corners and the adjacent face of the blank body, and means for extracting the folded edged blank from said throat.

2. A machine for forming conical necked flat tubular wrappers comprising a feed throat for the wrapper blanks having upper and lower templet edges between which said wrapper blanks are fed, means for simultaneously folding the mouth corners of the aforesaid wrapper blanks over the templet edges of the throat, means for distributing adhesive substance under the folds, and means for compressing the folds and extracting the completed wrapper from said throat.

3. A machine for forming conical necked flat tubular wrappers comprising a feed throat for the wrapper blanks having upper and lower templet edges between which said wrapper blanks are delivered, means for intermittently feeding the wrapper to the throat, upper and lower rotatory wiper

wings adapted to fold the mouth corners of the aforesaid wrapper blank over the templet edges of the throat during the delay in said feed, means for distributing adhesive material under the folds, and means for compressing the rolls and extracting the wrapper from said throat.

4. A machine for forming conical necked flat tubular wrappers from a tubular strip comprising means for cutting the tubular strip into predetermined lengths, a forming throat having an upper templet edge and a lower templet edge opposite the upper templet edge, means for intermittently feeding the cut lengths into the throat, means for simultaneously folding the mouth corners of the lengths over the templet edges of said throat during a delay of the feed, and rotatory snapping rolls for engagement with the folded mouths of the wrappers.

5. A machine for forming conical necked flat tubular wrappers comprising a feed throat for the wrapper blanks having upper and lower templet edges between which said wrapper blank is fed, spirally formed rotatory wiper wings for folding the mouth corners of the aforesaid wrapper blank over the templet edges of the throat, apertured nozzles extending in juxtaposition to the discharge end of the throat for engagement with the wrapper folds, and means for compressing said wrapper folds and extracting the wrapper from the throat.

6. A machine for forming conical necked flat tubular wrappers comprising a feed throat for the wrapper blanks having upper and lower inclined edges, a rotatory spirally formed wiper wing in juxtaposition to each edge of the throat, means for imparting continuous drive to the wiper wings in opposite directions, an oscillatory frame, snapping rolls carried by the frame for engagement with the mouths of the wrappers whereby they are extracted from the throat, and means for imparting oscillatory movement to said frame.

In testimony that I claim the foregoing I have hereunto set my hand at Oshkosh in the county of Winnebago and State of Wisconsin in the presence of two witnesses.

WILLIAM DICHMANN.

Witnesses:
W. F. GRUENEWALD,
EMMA ROBERTSON.