July 24, 1934. H. IRMSCHER 1,967,441

WINDING MECHANISM FOR TEA BAG MACHINES

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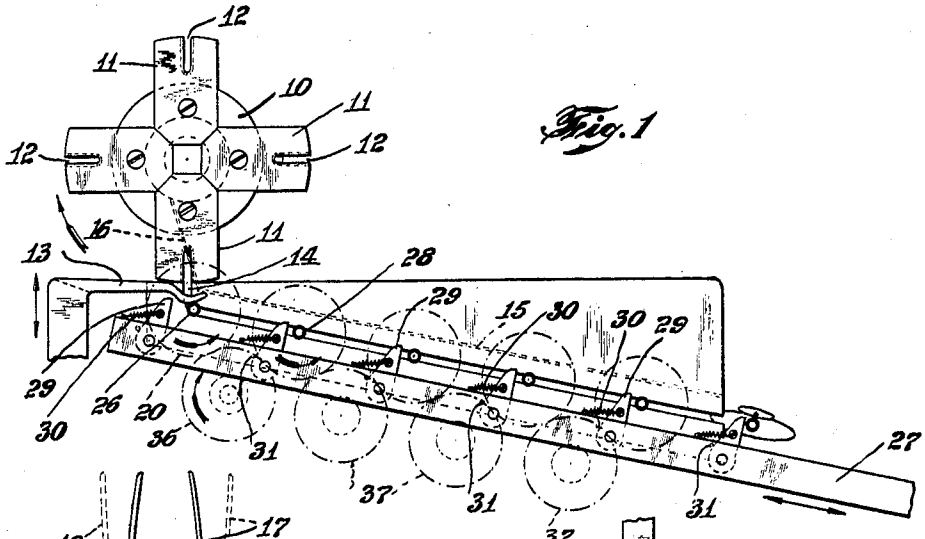


Fig. 1

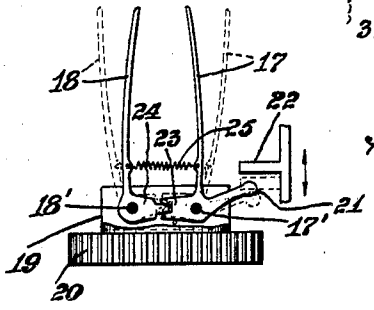


Fig. 3

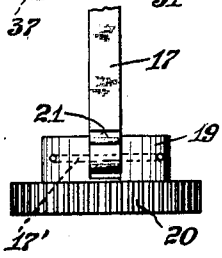


Fig. 4

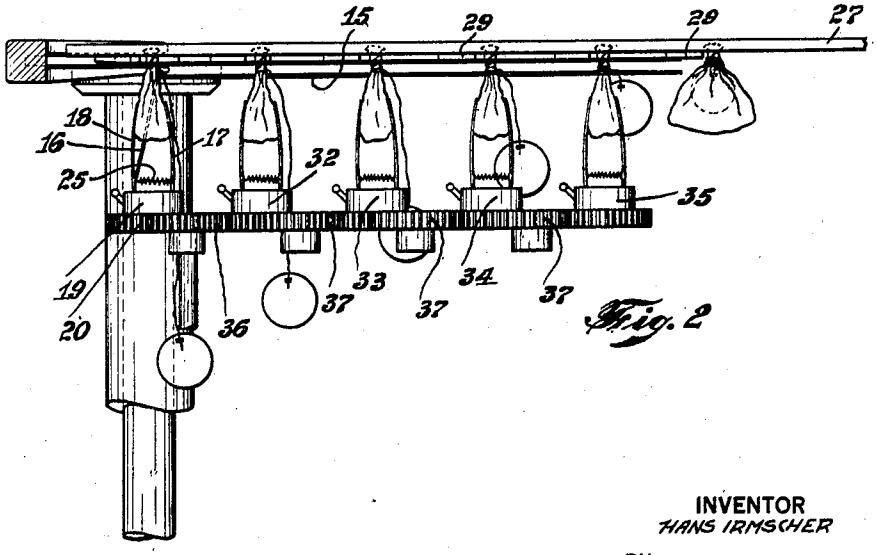


Fig. 2

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WINDING MECHANISM FOR TEA BAG MACHINES

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2 Claims. (Cl. 226—56)

The present invention relates to closing mechanisms for closing and fastening receptacles such as tea bags and the like and embodies, more specifically, an improved mechanism for securing a string to a receptacle in such fashion that the string does not become entangled with the strings of other receptacles.

In the bagging of tea it is common practice to attach strings to the bags, the ends of the strings having tags secured thereto. When a number of bags bearing such strings and tags are placed in a common container, the strings and tags thereof frequently become tangled and occasion considerable difficulty in the separation and use thereof. A number of constructions have been suggested to avoid this condition and one such suggestion includes the winding of the string about the neck of the bag to which it has been secured, thus decreasing the effective length thereof. When the bag is to be used the string may be easily unwound from about the neck thereof, thus enabling the bag to be packed and removed from a receptacle without the annoyance and inconvenience of having its string and tag become entangled with the corresponding elements of adjacent bags.

In order that a device may be provided for positioning the strings and tags upon bags or other receptacles in such fashion that a non-tangling construction results, the present invention has been designed and an object thereof is to provide a means for winding a string about the neck of a bag after the same has been secured thereto.

A further object of the invention is to provide a device for removing bag-like receptacles from a closing device after strings and tags have been secured thereto by such closing device the mechanism including a means for rotating the bags to cause the strings thereof to be wound about the necks of the respective bags.

A further object of the invention is to provide a winding device whereby strings may be wound about the necks of bag-like receptacles, the device including mechanism for rotating the bags and guiding the strings secured thereto in such fashion that each bag has its tag secured substantially adjacent thereto and without an appreciable length of string therebetween.

Further objects, not specifically enumerated above, will be apparent as the invention is described in further detail in connection with the accompanying drawing, wherein:

Figure 1 is a plan view of a winding machine constructed in accordance with the present invention.

Figure 2 is a view, in front elevation, showing the winding machine of Figure 1.

Figure 3 is a detail view showing one of the winding elements of the mechanism shown in Figures 1 and 2.

Figure 4 is a detail view of the device shown in Figure 3, this view illustrating the winding device after having been turned through 90°.

Referring to the above drawing, a closing device by means of which bag-like receptacles are closed and have strings secured thereto is shown at 10. This device follows standard practice and, of itself, constitutes no part of the present invention. It will suffice to state that, in accordance with existing practice, closing devices are now in use by means of which a ring or clamp is secured about the neck of a bag-like receptacle, a string being secured under the clamp whereby a suitable tag is attached to the bag-like receptacle.

From the device 10, which may include a plurality of radially extending arms 11, in each of which a slot 12 is formed, bags are removed by means of a hook-shaped arm 13. This arm is adapted to reciprocate, as indicated by the double-headed arrow of Figure 1, and thus removes bags from the arms 11 and directs them into a groove 14. The necks of the bags are directed through groove 14 in a step-by-step fashion as will appear in connection with the description given hereinafter.

Inasmuch as each bag which is removed from the device 10 has secured thereto a string and tag, and inasmuch as each bag is rotated to wind such string about the neck thereof, a guide means must be provided to maintain the string in proper winding relationship with its bag. Accordingly, a guide reel 15 is provided, having a downwardly extending end 16 against which the strings of the respective bags move as the device 10 is turned in the direction indicated by the curved arrow of Figure 1. When the strings engage the downwardly extending portion 16 the respective bags are in position to be removed from the arms 11 and directed into the groove 14. In this fashion, the string of each bag is guided along the reel 15 and wound substantially in the plane of the neck of its respective bag.

As a bag is moved into groove 14, it is received between a pair of arms 17 and 18, pivoted at 17' and 18', respectively, upon a base 19. Base 19 is provided with a gear 20 whereby the base may be rotated in a suitable fashion. Arm

17 is formed with an extension 21 which is adapted to be engaged by an arm 22 which is vertically reciprocable. Between the arms 17 and 18 interengaging arms 23 and 24 are provided whereby simultaneous movement of each arm is occasioned upon actuation of arm 21. The arms 17 and 18 are normally urged together by means of a spring 25.

As a bag is directed into groove 14 by arm 13, the arm 22 is depressed to open arms 17 and 18. This position is indicated in dotted lines in Figure 3. When the neck of the bag has reached the position indicated at 26, arm 22 is elevated and the bag is gripped by the arms 17 and 18. Gear 20 is then actuated to rotate the bag and arms a predetermined amount whereby the string may be wound about the neck of the bag. After such rotation has been completed, a slide 27 is actuated to move the bag to a second station indicated at 28. To effect such movement the slide is provided with a plurality of detents 29, normally urged in a counter clockwise direction, as viewed in Figure 1, by means of springs 30 and normally maintained in the positions illustrated in Figure 1 against stops 31. The detents may thus yield in a clockwise direction but, when against stops 31, do not yield in a counter clockwise direction. In this fashion, the detents may slide over the necks of the bags within groove 14 and upon movement of slide 27 to the right, as viewed in Figure 1, the detents advance the bags along the groove 14 to successive string winding stations.

In the construction shown, a plurality of bases 19, 32, 33, 34 and 35 are provided. Each of these bases are formed with a gear similar to the gear 20 upon base 19. A driving gear 36 is provided for driving gear 20 and a plurality of idler gears 37 are connected between adjacent gears 32, 33, 34 and 35. Each base is provided with pairs of arms similar to arms 17 and 18 and each pair of arms is actuated in the manner described in connection with the actuation of arms 17 and 18. Whether each base is rotated a half turn or one or more turns is immaterial, it being necessary only that each base come to rest with its arms in a bag receiving position. In other words, the arms should be so positioned that a bag, in advancing through the groove 14, may pass between such arms. The movement of the slide 27 is such as to move the respective bags between the respective stations in order that they may be properly placed between the successive pairs of arms and the final movement of the bag in the groove 14 discharges a wound bag from the groove with the string thereof substantially completely wound about its neck.

While the invention has been described with reference to the specific progressive winding mechanism shown in the accompanying drawing, it will be apparent that this mechanism may be varied considerably and the elements thereof changed to effect the winding operation in one or more stations without departing from the scope of the invention as defined in the appended claims.

I claim as my invention:

1. A device of the character described comprising means to direct a bag-like receptacle having a string secured adjacent the neck thereof to supporting means, supporting means comprising a plurality of pairs of relatively movable arms adapted to engage the bag, means to rotate the arms, and means to guide the bag to successive pairs of said relatively movable arms.

2. A device of the character described comprising means to direct a bag-like receptacle having a string secured adjacent the neck thereof to supporting means, supporting means comprising a plurality of pairs of relatively movable arms adapted to engage the bag, means to rotate the arms, means to move the bag to successive pairs, and means to guide the string substantially in the plane of the neck of the receptacle.

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