Oct. 28, 1924. 1,513,464

J. KLEIDMAN

BAG CLOSING MACHINE

Original Filed May 28, 1919 7 Sheets-Sheet 1

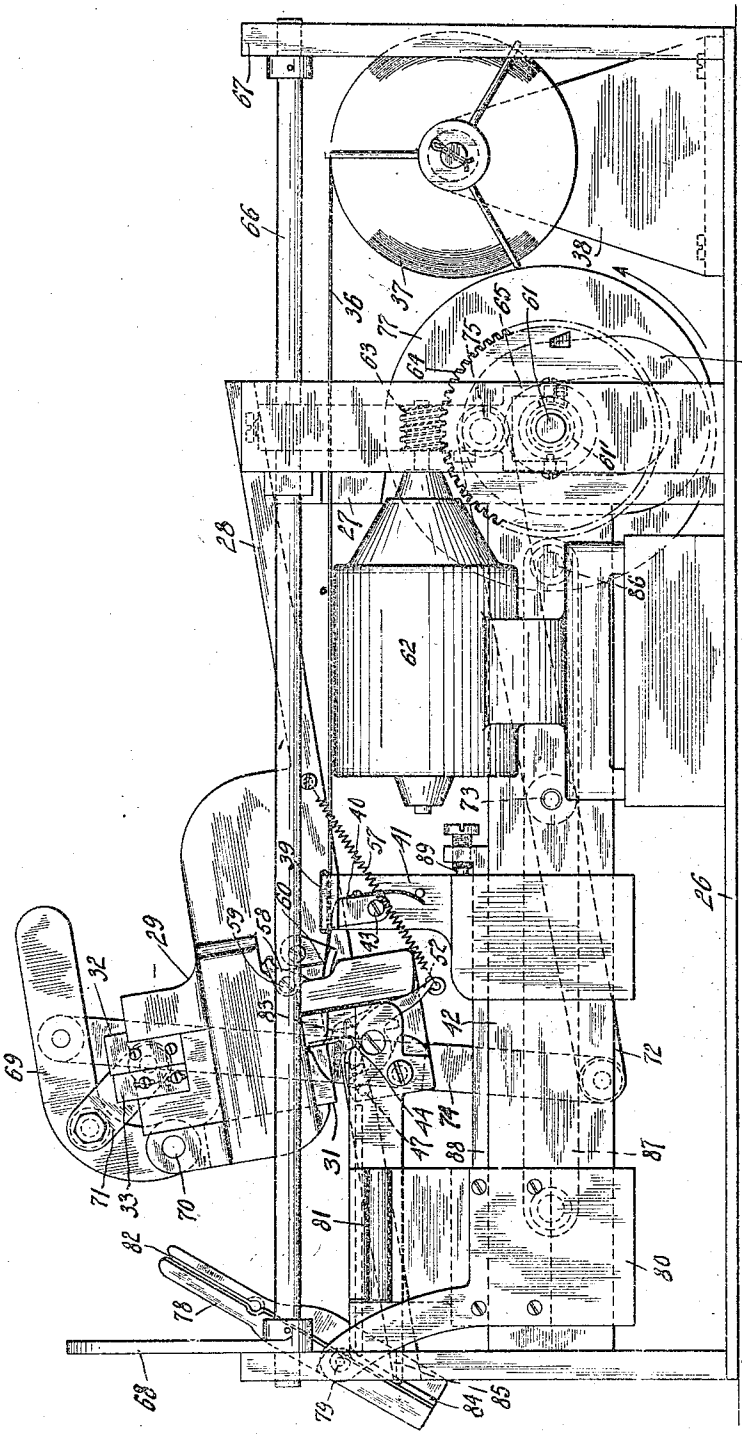


Fig. 1.

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BAG CLOSING MACHINE

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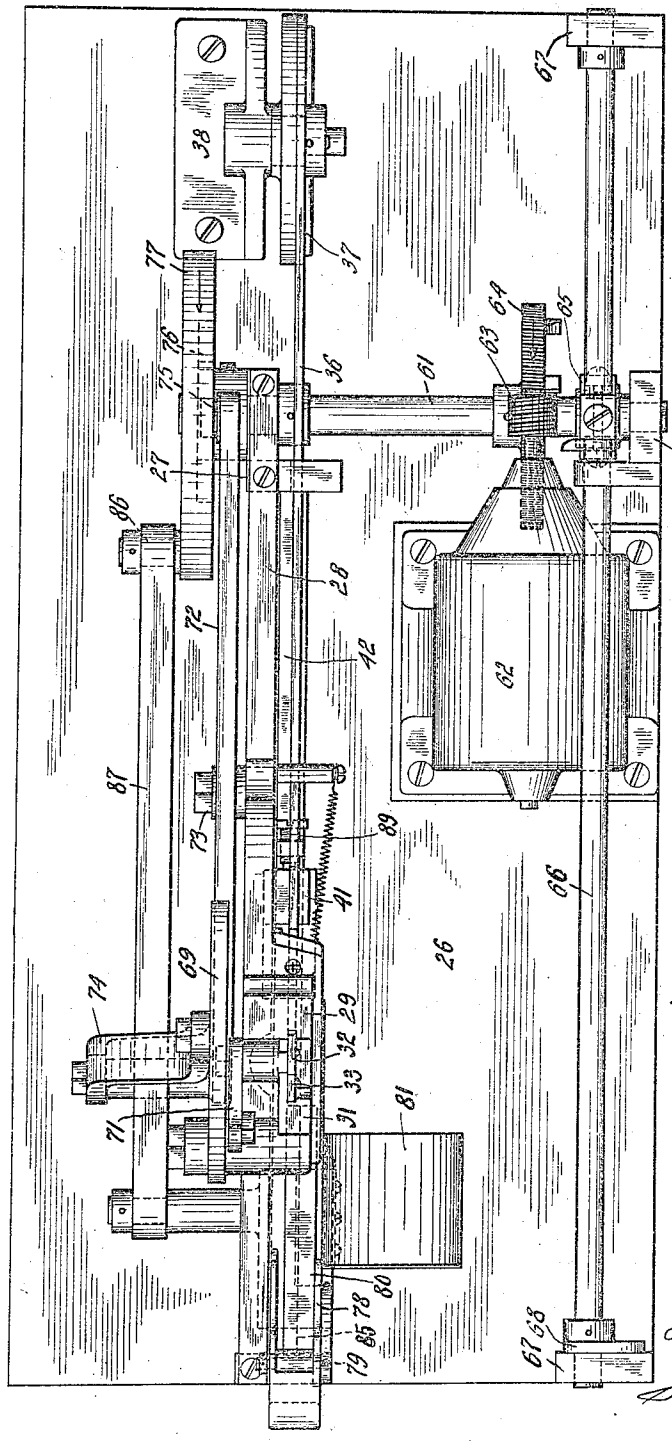


Fig. 2.

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BAG CLOSING MACHINE

Original Filed May 28, 1919 7 Sheets-Sheet 5

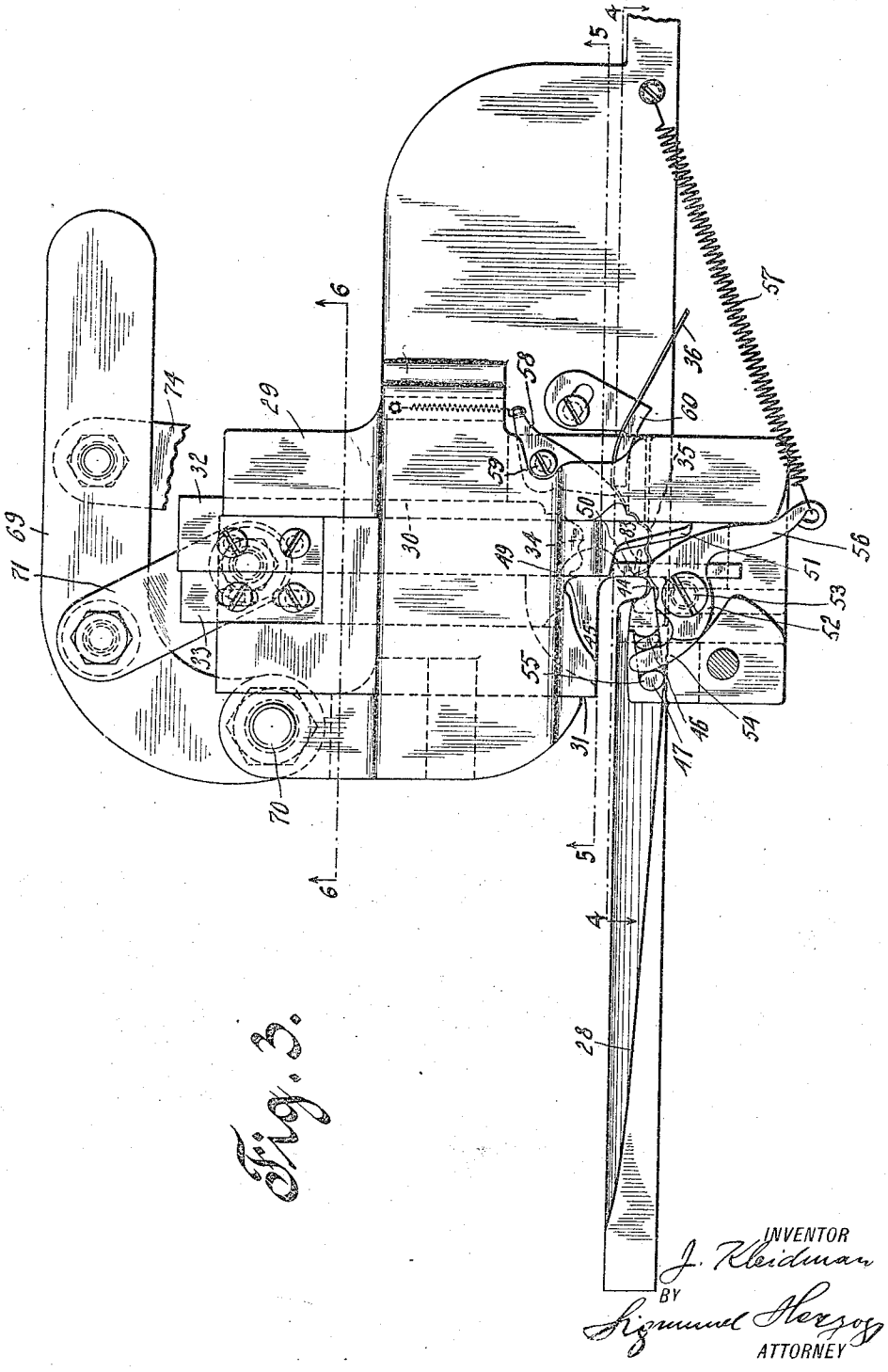


Fig. 3.

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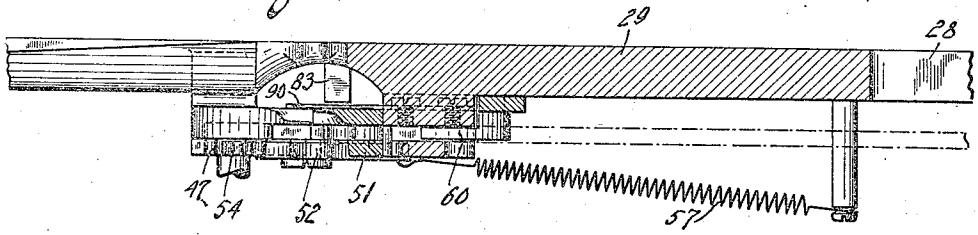
Oct. 28 . 1924. 1,513,464

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BAG CLOSING MACHINE

Original Filed May 28, 1919 7 Sheets-Sheet 4

Fig. 4.



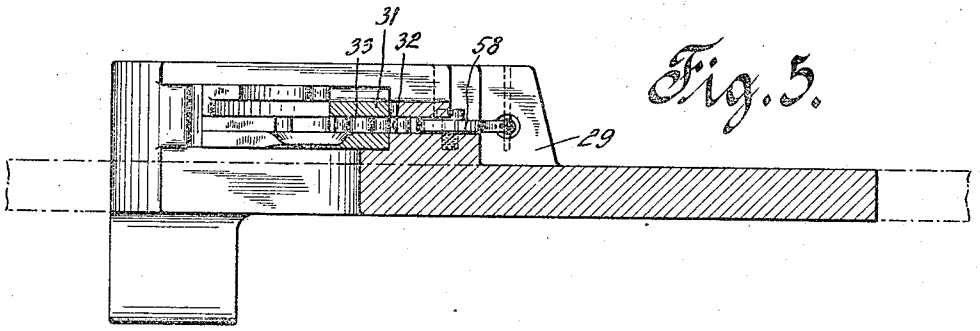


Fig. 5.

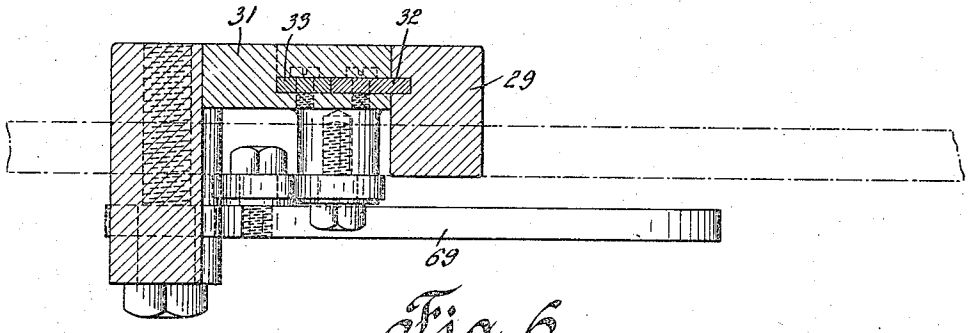


Fig. 6.

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1,513,464

BAG CLOSING MACHINE

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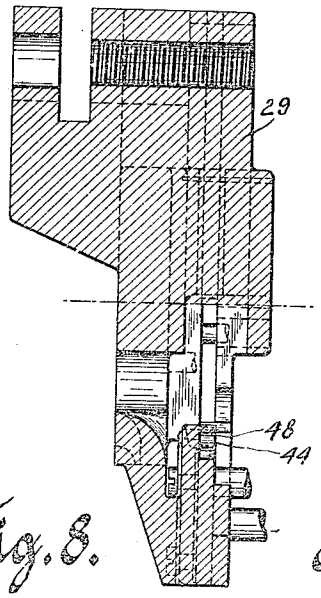


Fig. 8.

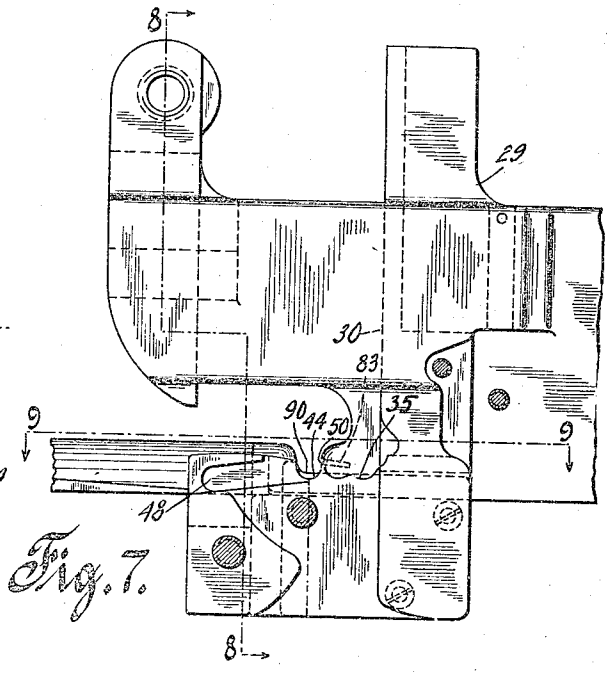


Fig. 7.

Fig. 10.

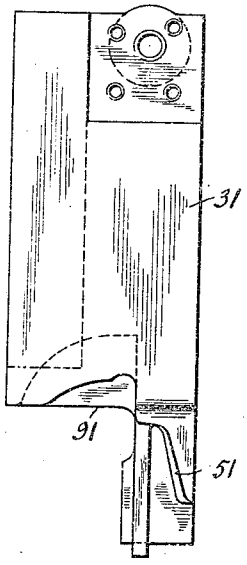


Fig. 9.

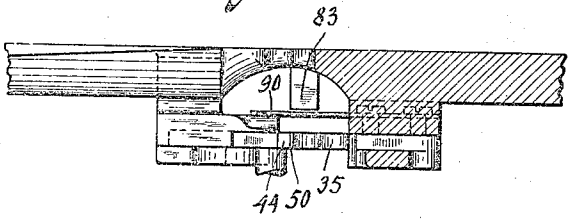


Fig. 12.

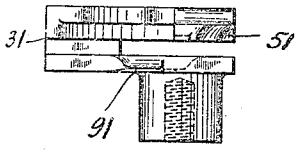
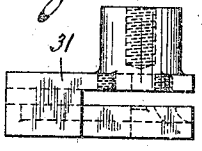


Fig. 11.



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BAG CLOSING MACHINE

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Fig. 13.

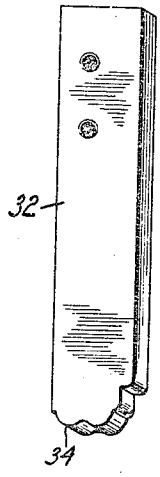


Fig. 14.

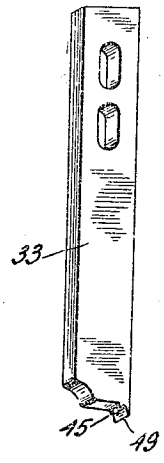


Fig. 15.

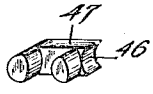


Fig. 19.

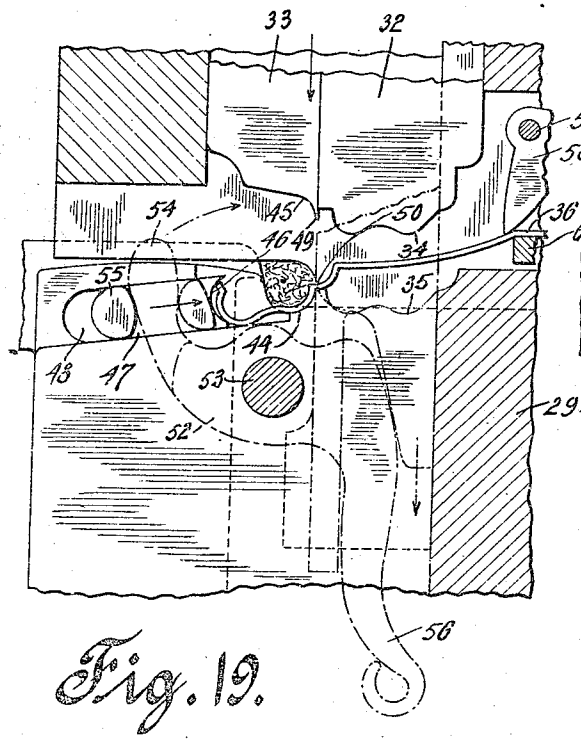
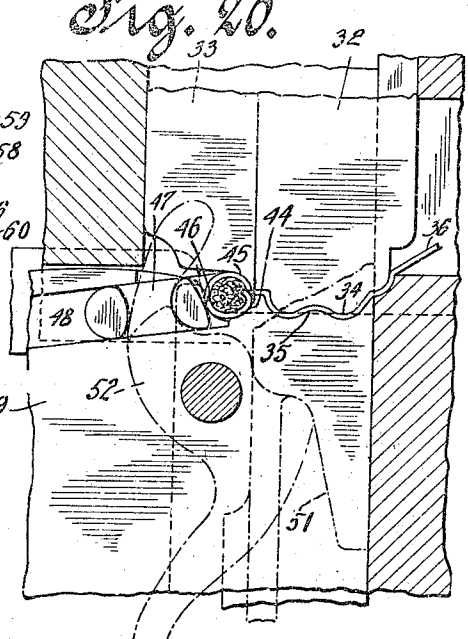


Fig. 20.



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BAG CLOSING MACHINE

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Fig. 16.

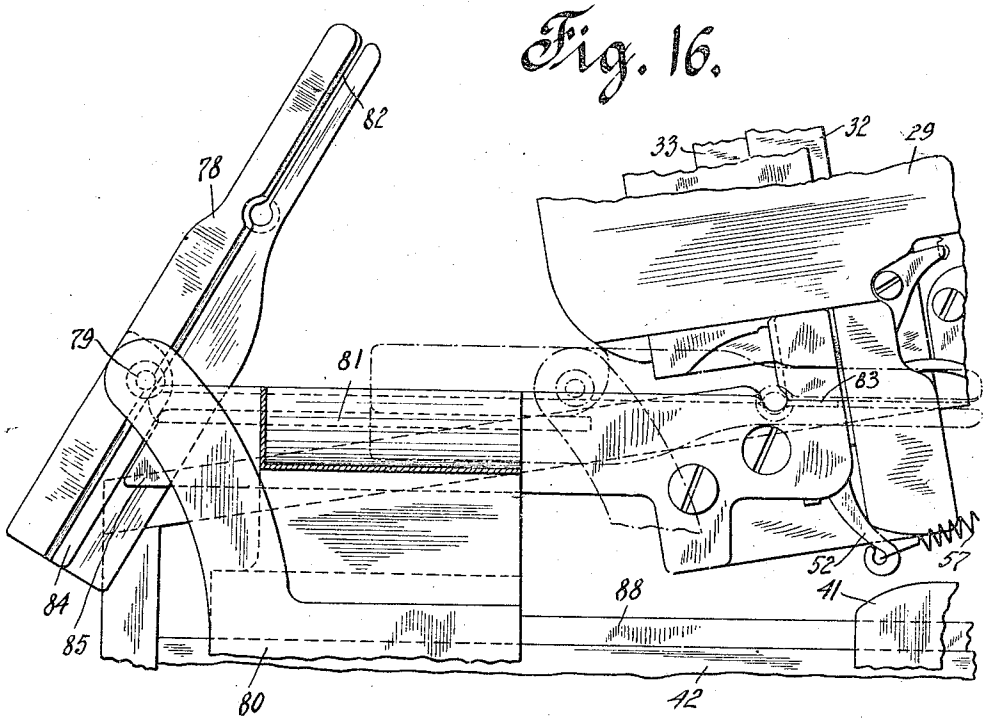


Fig. 17.

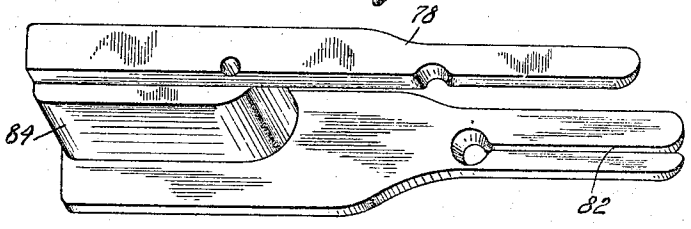
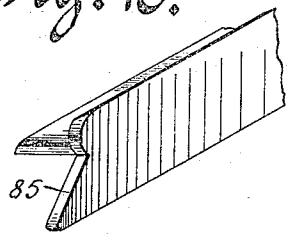


Fig. 18.



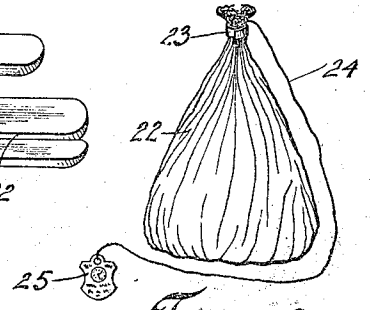


Fig. 21.

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Sigmund Herzog

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Patented Oct. 28, 1924. 1,513,464

UNITED STATES PATENT OFFICE.

JOSEPH KLEIDMAN, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MILLIE PATENT HOLDING CO. INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

BAG-CLOSING MACHINE.

Application filed May 28, 1919, Serial No. 300,369. Renewed March 29, 1924.

To all whom it may concern:

Be it known that I, JOSEPH KLEIDMAN, a citizen of Russia, and a resident of the city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Bag-Closing Machines, of which the following is a specification.

The present invention relates to improvements in machines for closing bags. It pertains more particularly to a machine for closing bags of the type described in an application for U. S. Letters Patent, Serial No. 261,867, filed by Benjamin Hirschhorn on November 9, 1918; now Patent No. 1,310,796. In the said application a bag is described constituting a cartridge for percolating or extracting the flavor from tea leaves or coffee, said cartridge comprising a bag having its mouth drawn into folds or puckered, in combination with a metal strip that encircles and compresses said folds.

The main object of the present invention is to provide a simple and easily operable mechanism, whereby the mouth of an already filled bag is closed by puckering the same and applying thereto a metal band, in the form of a ring, that embraces the puckered portion of the bag, so as to prevent escaping of the contents.

Another object of the invention is to provide a bag closing machine of the character mentioned which is automatic in its operation.

With these and other objects in view, which will more fully appear as the nature of the invention is better understood, the same consists in the combination, arrangement and construction of parts hereinafter described, pointed out in the appended claims and illustrated in the accompanying drawings, it being understood that many changes may be made in the size and proportion of the several parts and details of construction within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

One of the many possible embodiments of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a bag closing machine constructed in accordance with the present invention; Fig. 2 is a top plan view thereof; Fig. 3 is a front elevation, on a larger scale, of the closure forming and clenching mechanism of the machine; Fig. 4 is a section taken on line 4—4 of Fig. 3; Fig. 5 is a section taken on line 5—5 of Fig. 3; Fig. 6 is a section taken on line 6—6 of Fig. 3; Fig. 7 is a front elevation, on a larger scale, of the stationary head of the detail shown in Fig. 3; Fig. 8 is a section taken on line 8—8 of Fig. 7; Fig. 9 is a section taken on line 9—9 of Fig. 7; Fig. 10 is a rear elevation of a die carrying slide mounted on the head shown in Fig. 7; Fig. 11 is a top plan view of this slide; Fig. 12 is a bottom plan view of the same; Fig. 13 is a perspective view of a male forming die on the slide shown in Fig. 10; Fig. 14 is a perspective view of a combined severing knife and clenching mechanism mounted on the slide shown in Fig. 10; Fig. 15 is a perspective view of another portion of the clenching die; Fig. 16 is a front elevation, on a larger scale, of a portion of the closure forming and clenching mechanism, showing the puckering element thereon; Fig. 17 is a perspective view of the puckering device; Fig. 18 is a perspective view of a cam coacting with the puckering device; Figs. 19 and 20 are diagrams showing, in different positions, the elements of the closure forming and clenching dies; and Fig. 21 is an elevation of the finished product made on the machine.

Before describing the machine, the product made thereon will be disclosed. This product is shown in Fig. 21 of the drawings, and comprises a bag 22 of open-mesh textile fabric, such as for instance cotton, and of a size to contain just sufficient tea leaves or coffee for a single brewing. The mouth of the bag is closed by drawing or gathering the same into folds, and applying thereto a metallic band 23, that is shaped to assume the form of a ring, embracing the folded

portion of the bag below its mouth, thereby holding the folds under compression, so as to prevent escaping of the contents. For the purpose of facilitating the handling of the cartridge, there is secured thereto a flexible means, for instance a string 24, to which is attached at its free end a handle 25. This string serves also as the means for suspending the cartridge from the receptacle, such as a tea-pot or coffee-pot, in which the extraction is to take place. The string is secured to the cartridge by placing it against the folds around the bag mouth, before the band 23 is formed to constitute a ring-shaped closing means for the bag.

The machine comprises a base plate 26, from which rise standards 27, supporting an inclined bar 28, with which is made, preferably, integral a vertical upwardly projecting head 29, having a guideway 30, that extends in a vertical plane at right angles to the longitudinal axis of the bar 28. In this guideway is reciprocably mounted a die-carrying slide 31, to which is fixed the male member 32 of a forming die and also a combined strip cutter and clenching die 33. The acting face 34 of the male member of the forming die is convex, it being constituted by two intersecting substantially semi-cylindrical surfaces, thereby resembling the numeral 3 placed horizontally. With this male die co-operates a similarly shaped female die 35 on the head 29, initially shaping the metal strip, of which the closure band 23 of the bag 22 is to be made.

The metal strip, denoted by the numeral 36, is wound upon a supply reel 37, that is rotatably mounted in a standard 38 on the base plate 26. This reel is disposed in front of the forming dies, the strip being led between the jaws 39 and 40 of a feeding member 41, the latter being reciprocably mounted upon a horizontally extending bar 42 that is disposed a suitable distance below the bar 28 and fixed to standards rising from the base plate 26. The jaw 39 is fixedly attached to the feeding member 41, the strip 36 abutting against its underface, it being held thereagainst by the movable jaw 40, which is made in the form of a spring-pressed pawl, pivoted at 43 to the feeding member 41. The pawl is so shaped, that it grips the strip 36 on the stroke of the feeding member toward the forming dies, but permits the strip to remain stationary on its stroke in the opposite direction. The means for actuating the feeding member will be described hereinafter.

In the rear of the female forming die 35 is provided in the head 29 a notch 44. With this notch co-operates a concave portion 45 in the end face of the clenching die 33, and a substantially semi-circular notch 46 in a block 47. This block is shiftably mounted in a slot 48 in the head 29. The said notches and end face, when brought together, complete a cylindrical recess, constituting the die, for forming and applying the metal band 23 to the bag. The front transverse edge 49 of the concave face 45 on the clenching die forms, in co-operation with a sharp edge 50 in rear of the female forming die, a cutting mechanism for severing the initially shaped closure band from the strip 36.

The block 47 is actuated by the slide 31, which is provided for this purpose with a cam face 51, acting against a bell crank lever 52. This lever is fulcrumed at 53 to the head 29, one of its arms, denoted by the numeral 54, being disposed between two lugs 55 on the block 47, while its other arm, denoted by the numeral 56, is in engagement with one end of a spring 57, the other end of the latter being fastened to the said head. When the slide 31 moves downwards and the section 45 of the ring forming and applying die is brought toward the stationary section 44 thereof, the cam causes the bell-crank lever to swing around its fulcrum in the direction of the arrow shown in Fig. 19 of the drawings, thereby bringing the section 46 of the ring forming and applying die into operative relation to the other two sections thereof, shaping the initially formed bag fastener into a ring. (Fig. 20). The spring 57 returns the block 47 to its outer position, when the slide 31 moves upwards.

For the purpose of preventing a shifting of the strip 36 when the feeding means moves toward the reel 37, there is provided a presser foot 58, that is pivoted at 59 to the head 29 and clamps the strip against a stationary jaw 60 on the said head. The presser foot permits the strip to travel toward the forming dies, but keeps it stationary when the feeding means moves toward the reel 37.

The slide 31 is actuated from the driving shaft 61 of the machine, said shaft being journaled in bearings 61′ and rotated by any suitable source of power, for instance an electric motor 62. To the shaft of this motor is fixed a worm 63, in mesh with a worm gear 64, the latter being loosely mounted upon the driving shaft 61 and connected therewith by a clutch mechanism of any suitable type. One member of this mechanism is formed upon the worm gear, and its other member upon a fork-shaped lever 65, that is fixed to a longitudinally extending rod 66, which is oscillatably mounted in standards 67 on the base plate 26, and provided in rear of the head 29 with a handle 68. The clutch is preferably of such construction that, when its members are brought in engagement, the shaft 61 makes one complete revolution, after which the clutch members are disengaged automatically. The connection between the driving shaft 61 and the slide 31 includes a lever 69, which is fulcrumed at 70 to the head 29 and connected by a link 71

with the slide 31. A lever 72 is pivoted at 73 to the bar 42, one end of said lever being connected with the lever 69 by a link 74, while its other end carries a lug 75, that reaches into a cam groove 76 in a disk 77, the latter being fixed to the driving shaft 61.

The means for puckering the bag comprises a fork 78, that is pivoted at 79 to a slide 80 on the bar 42. From this slide extends upwards a bag support 81 in the form of a trough, against the free edges of which the prongs of the fork are adapted to abut. One prong of the fork is provided with a longitudinal slot 82, adapted to receive a stop 83 in front of the notch 44 (Fig. 3), when the said fork slides in horizontal position toward the said notch. The mouth of the bag is placed in flat condition into the slot 82, the other prong of the fork forcing the bag against the bag support, and, as then the slide 80 moves toward the stop 83, the bag is puckered by the time it arrives at the notch 44, thus being ready to receive the closing band. The puckering operation is performed by the fork 78, carrying the bag against the stop 83. The body portion of the fork is provided beyond its pivot 79 with a weight 84, which causes the fork to tilt around its pivot, when the slide 80 moves to its outermost position (Figs. 1 and 16), in which the fork is ready to receive the bag. When the slide 80 moves toward the head 29, a cam 85 on the machine frame causes the fork to assume a horizontal position, in which it is adapted to co-operate with the stop 83.

The slide 80 is actuated from the driving shaft 61, the disk 77 being provided with a crank pin 86, with which engages one end of a connecting rod 87, the other end of which is pivoted to the slide 80.

The slide 80 serves also to operate the feeding member 41. For this purpose there is attached to the said slide a shifter 88, in the form of a bar that extends in parallel relation to the bar 42 through the feeding member 41, and is provided upon its free end with a lug 89, in the form of a screw. The slide 80 and feeding member 41 are so arranged in relation to each other that, as the said slide moves toward the head 29, it causes the feeding member 41 to move a predetermined distance toward the reel 37, the lug 89 causing the feeding member to move toward the head 29 when the slide 80 moves in the opposite direction. The extent of feeding forward of the strip 36 depends obviously upon the distance between the slide and the point of the screw 89. The screw thus permits of an adjustment of the stroke of the feeding member 41.

The cam groove 76 is so shaped and the crank pin 86 is so disposed in relation thereto that the puckering fork reaches its innermost position before the slide 31 with the dies thereon are caused to move downwards.

The forks of the puckering member are spaced apart a distance that is somewhat larger than the width of the strip 36, the initially formed closing strip being brought between the prongs of said puckering fork.

While the bag is being closed, its mouth portion is trimmed by a cutting implement, comprising a stationary blade 90 on the head 29 and a movable blade 91 on the slide 31.

The operation of the machine is as follows: When the parts are in the positions shown in Fig. 1 of the drawings, that is to say when the puckering member is in its outer position and extends at an angle to the horizontal plane, a filled bag, with its mouth flat, and a string 24 are inserted into the slot 82 in the puckering member. The clutch handle 68 is then moved in the proper direction to shift the two members of the clutch into engagement, whereby the puckering member is brought, by the cam 85, into horizontal position and then moved toward the stop 83, thereby causing the mouth of the bag to be gathered or drawn into folds, as it is carried toward the said stop. Simultaneously with this operation, the slide 80 moves the feeding member 41 toward the reel 37, the presser foot 58 preventing a movement of the strip 36 toward the reel. As soon as the puckering operation has been finished, the slide 31 moves toward the female dies, the male forming member 32 in co-operation with the female die 35 initially shaping the strip and the cutting edge 49 of the combined stripper and clenching die 33 cutting off the closure which has been initially shaped during the previous cycle of operation and fed forward so that one portion thereof rests within the notch 44, while its other portion abuts against the notched portion 46 of the block 47. The puckered mouth portion of the bag rests upon that portion of the closure which is within the notch 44, and, as now the slide 31 descends, its cam face 51 causes the lever 52 to swing around its pivot in the direction of the arrow shown in Fig. 19 of the drawings, whereby the closure strip is caused to move around the mouth of the bag. The clenching operation is performed, as above described, by the clenching die 33, the notch 44 and the block 47, the notches and concaved portion of the three latter elements forming a complete circle, when the slide 31 is in its lowermost and the block 47 is in its innermost position. At the same time the blades 90 and 91 trim the bag mouth. The slide 31, with the dies thereon, moves then upwards and the slide 80 outwards toward the clutch handle 68. When the last-mentioned slide moves in the direction indicated, its lug 89 is brought into abutment with the feeding member 41, caus-

ing the same to move toward the female forming dies, whereby the strip 36 is moved forward, its jaws 39 and 40 advancing the strip so that the previously initially formed portion thereof is brought into operative relation to the notch 44, as above mentioned. The puckering member has by this time moved to its outermost position (Fig. 1), the weight thereon causing it to swing from horizontal position into the position shown in Fig. 1, after which the cycle of operation now described may be repeated.

What I claim is:—

1. A bag closing machine, comprising metal strip feeding means, a stationary head, a slide thereon, coacting dies on said head and slide for initially shaping a portion of the strip, coacting means on said slide and head for severing from the body of the strip the portion shaped during the previous shaping operation, means for puckering the mouth of the bag and bringing the same into operative relation to the strip portion to be severed, coacting means on said slide and head for forming the portion of the strip to be severed into ring shape and applying the same during the process of formation to the puckered mouth portion of the bag, the forming means on said head being made of two sections, one stationary and the other movable, and means on said slide for actuating the movable section of said forming means.

2. A bag closing machine according to claim 1, including coacting cutters on said head and slide for trimming the bag.

3. A bag closing machine according to claim 1, including a slide carrying said puckering means, said slide actuating said strip feeding means.

4. A bag closing machine, comprising metal strip feeding means, a stationary head, a slide thereon, coacting dies on said head and slide for initially shaping a portion of the strip into two semi-circular intersecting sections, coacting means on said slide and head for severing from the body of the strip the portion shaped during the previous shaping operation, means for puckering the mouth of the bag and bringing the same into operative relation to one of the semi-circular sections of the strip portion to be severed, co-acting means on said slide and head for forming the portion of the strip to be severed into ring shape and applying the same during the process of formation to the puckered mouth portion of the bag, the forming means on said head being made of two sections, one stationary and the other movable, and means on said slide for actuating the movable section of said forming means.

Signed at New York, in the county of New York, and State of New York, this 12th day of May A. D. 1919.

JOSEPH KLEIDMAN.