Dec. 1, 1942. J. A. GAGE ET AL 2,303,351

TAMALE MACHINE

Filed Aug. 17, 1940 6 Sheets-Sheet 1

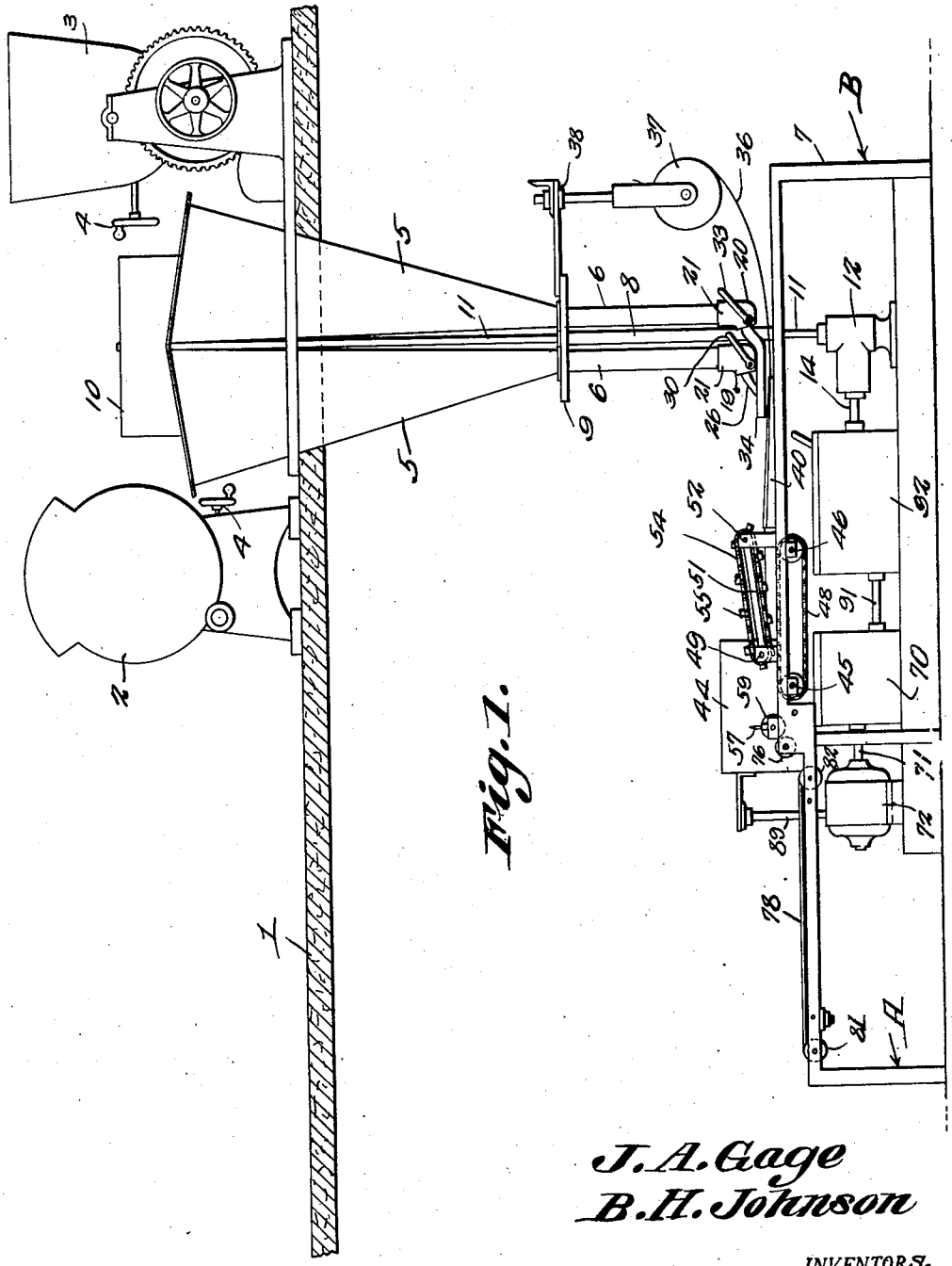


Fig. 1.

J. A. Gage
B. H. Johnson
INVENTORS.
BY C. A. Snow & Co.
ATTORNEYS.

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TAMALE MACHINE

Filed Aug. 17, 1940 6 Sheets-Sheet 2

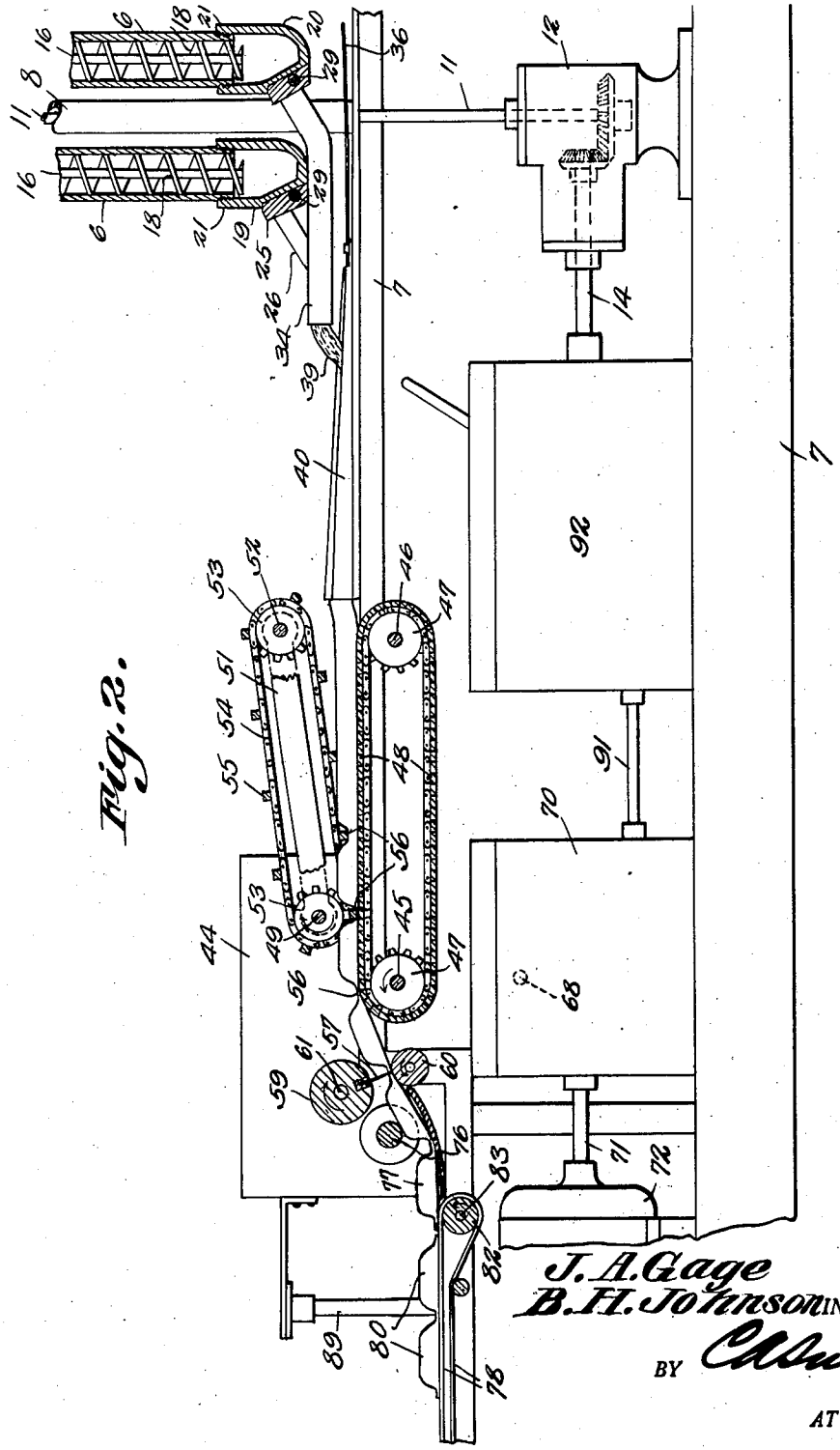


Fig. 2.

J. A. Gage
B. H. Johnson INVENTORS.

BY C. A. Snow & Co.

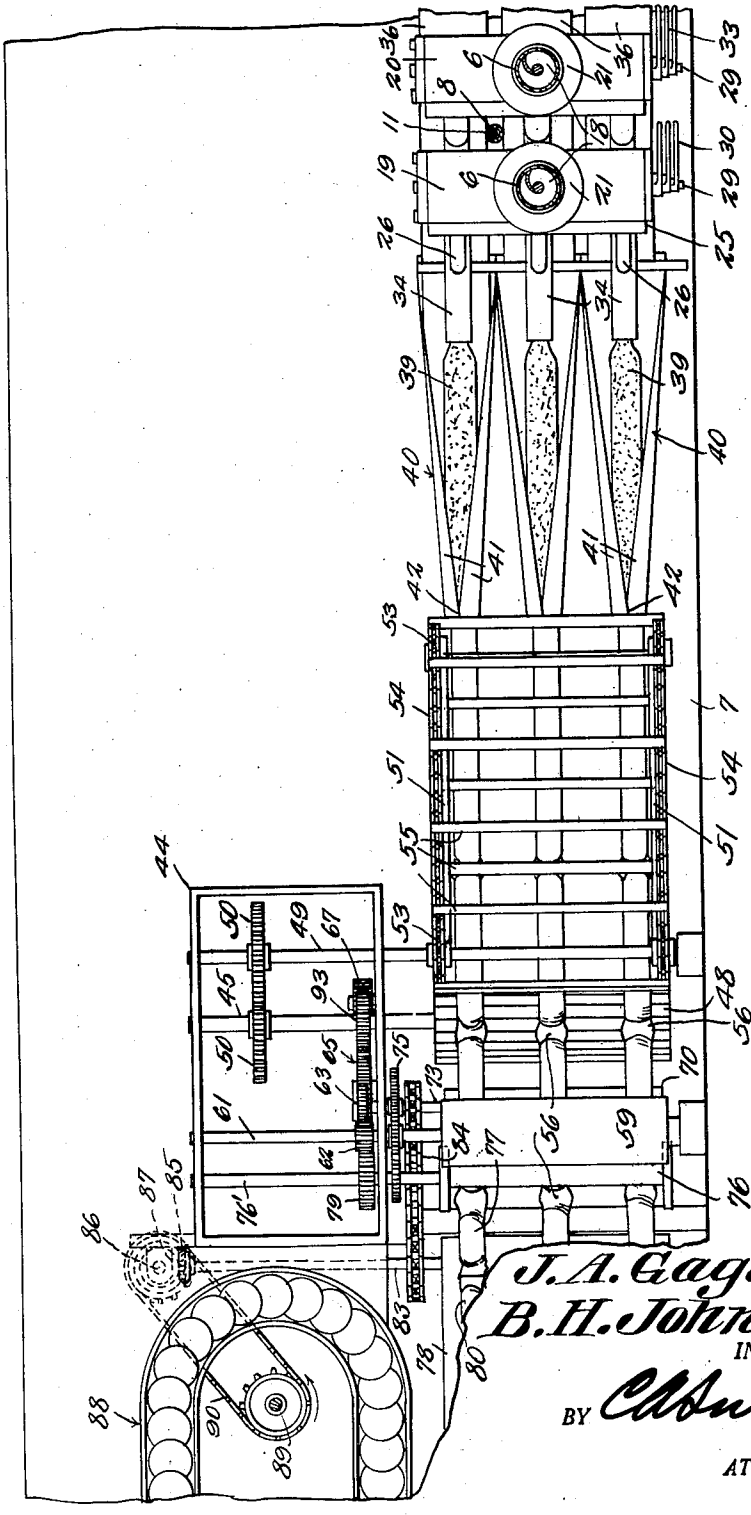
ATTORNEYS.

Dec. 1, 1942. J. A. GAGE ET AL 2,303,351

TAMALE MACHINE

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Fig. 3.



J. A. Gage
B. H. Johnson
INVENTORS.
BY Cl Snow & Co.
ATTORNEYS.

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TAMALE MACHINE

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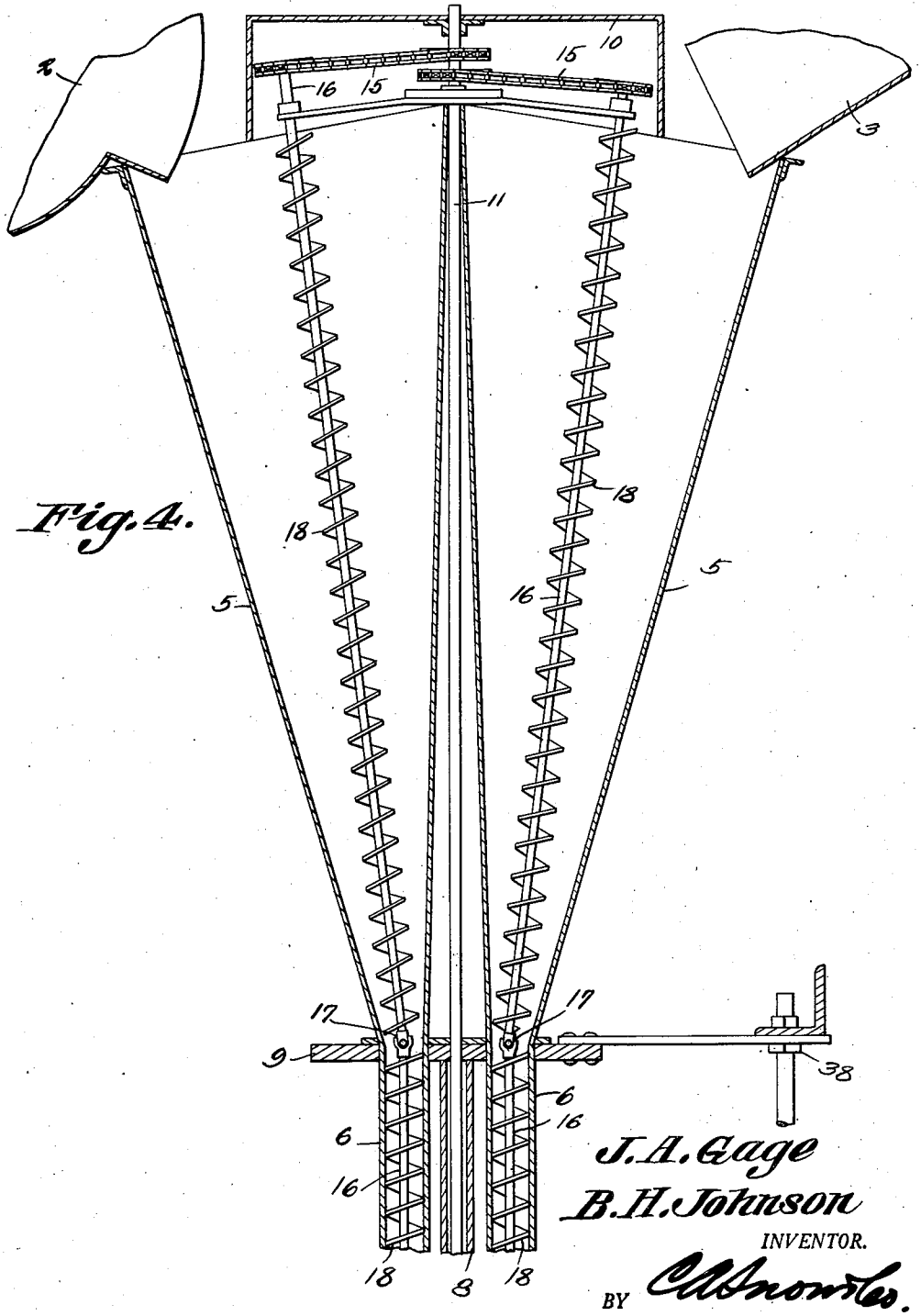


Fig. 4.

J. A. Gage
B. H. Johnson
INVENTOR.

BY C. L. Snow & Co.

ATTORNEYS.

Dec. 1, 1942. J. A. GAGE ET AL 2,303,351

TAMALE MACHINE

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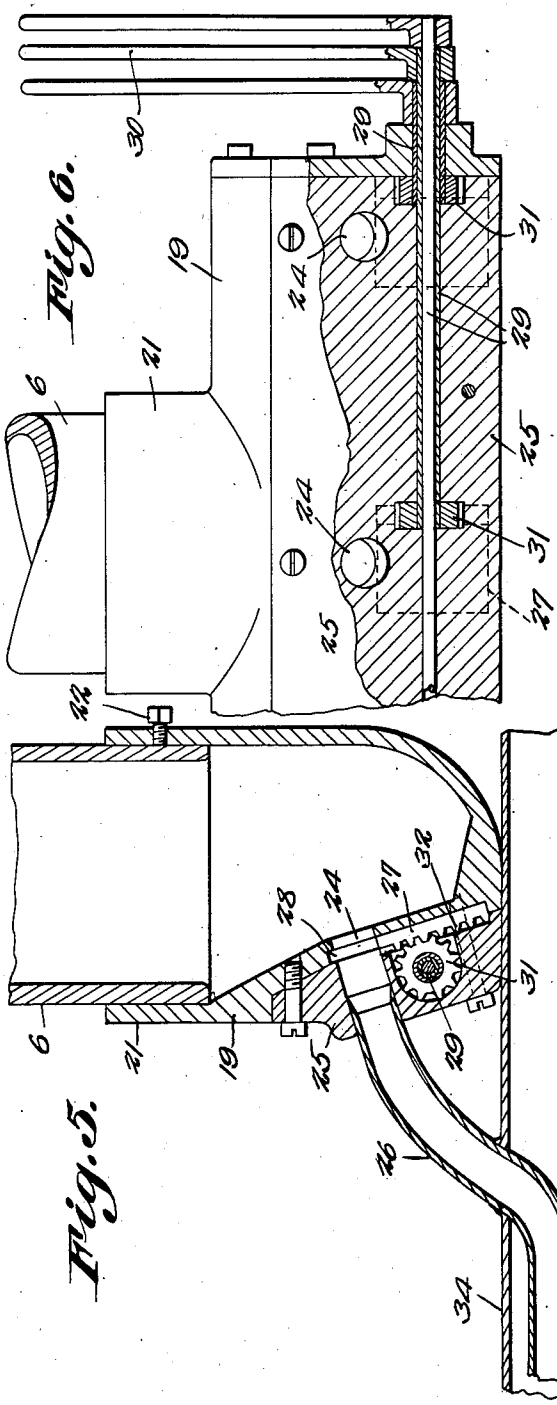


Fig. 5.

Fig. 6.

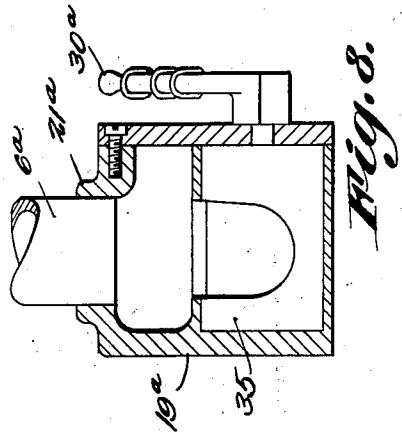


Fig. 8.

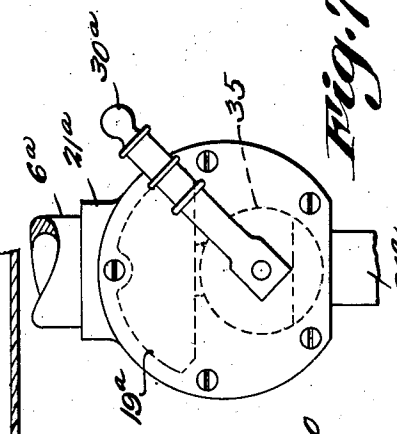


Fig. 7.

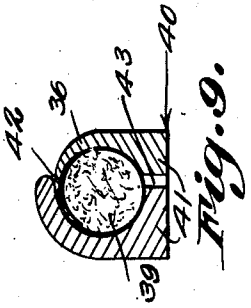


Fig. 9.

J. A. Gage
B. H. Johnson
INVENTORS.
BY Albright & Co.
ATTORNEYS.

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TAMALE MACHINE

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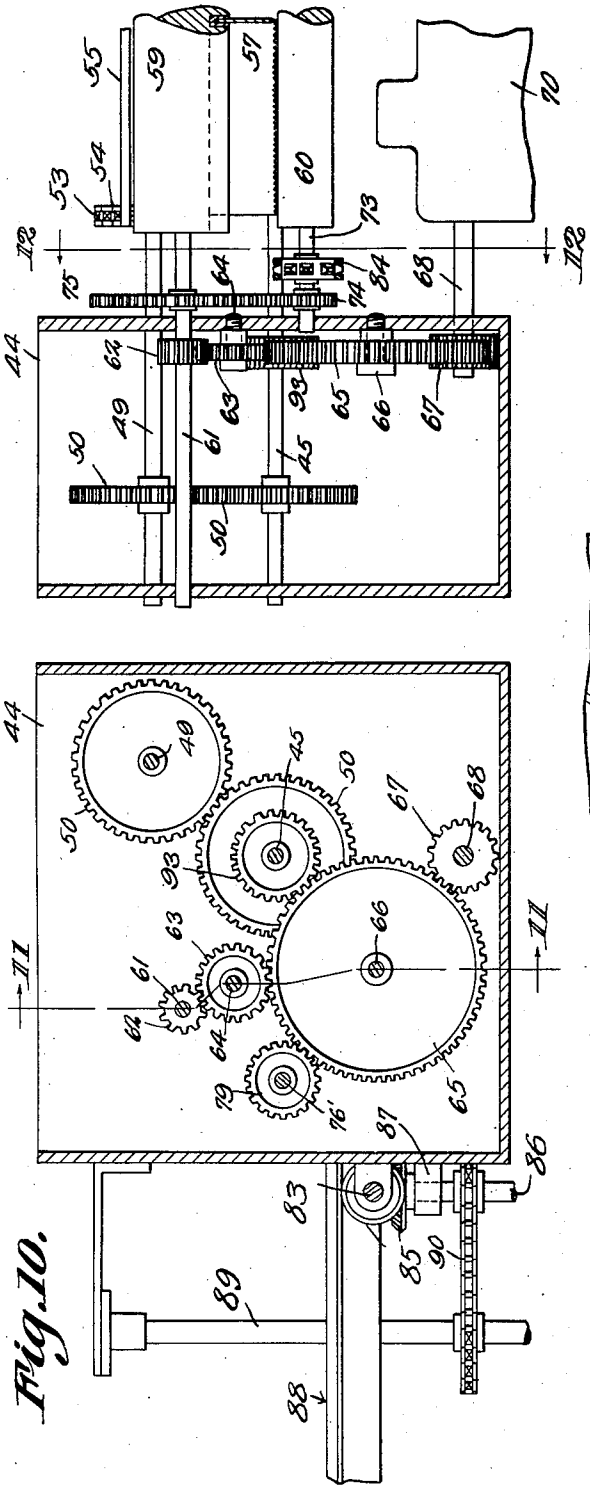


Fig. 10.

Fig. 11.

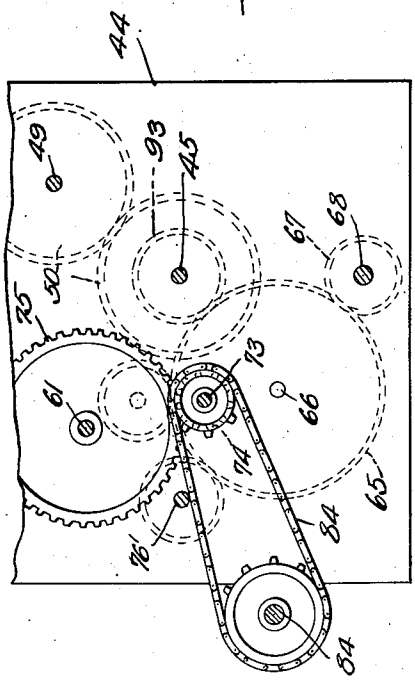


Fig. 12.

J. A. Gage
B. H. Johnson
INVENTOR.

BY Albrow & Co.
ATTORNEYS.

Patented Dec. 1, 1942 2,303,351

UNITED STATES PATENT OFFICE

2,303,351

TAMALE MACHINE

Joseph A. Gage and Ben Harve Johnson,
Dallas, Tex.

Application August 17, 1940, Serial No. 353,146

3 Claims. (Cl. 107—1)

The machine forming the subject matter of this application constitutes an improvement on our former machine shown in Patent No. 1,654,871, issued on January 3, 1928, and referred to therein as a machine for putting up tamales.

The present invention aims to provide an improved means for mixing tamale material, shaping the material, wrapping it, advancing the wrapped material, and severing it into foldable lengths, capable of being pushed in a can or other container.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:

Fig. 1 shows, in side elevation, a machine constructed in accordance with the invention;

Fig. 2 is a side elevation wherein parts are broken away;

Fig. 3 is a top plan wherein parts are broken away;

Fig. 4 is a vertical sectional view showing the hoppers and attendant parts;

Fig. 5 is a vertical sectional view of the valve mechanism;

Fig. 6 is a side elevation of the valve mechanism, parts being broken away, and parts being shown in section;

Fig. 7 is an end view showing a modified valve mechanism;

Fig. 8 is a transverse section of the valve mechanism depicted in Fig. 7;

Fig. 9 is a transverse section of one of the folders;

Fig. 10 is a side elevation showing a portion of the gearing, parts being removed;

Fig. 11 is a transverse section on the line 11—11 of Fig. 10;

Fig. 12 is a section on the line 12—12 of Fig. 11.

For convenience in describing the relative positions of parts, the portion of the machine marked by the letter A in Fig. 1 will be considered the forward end, the rear end being designated by the letter B.

The device forming the subject matter of this application is adapted to be used for making and packaging edible compounds of various kinds. In the interest of brevity, it will be called a tamale machine, and the ingredients of a tamale will be referred to as meat and mush.

In Fig. 1 there is shown an overhead support 1, which may be the upper floor of a building. On the support 1 is secured a cooker and mixer 2 for meat, and a mixer for mush, marked by the numeral 3. The mechanisms 2 and 3 include means 4 whereby they may be turned about a horizontal axis, to dump their contents, respectively, into funnel-shaped hoppers 5, detailed in Fig. 4. The hoppers 5 have reduced, depending necks 6.

Below the support 1, and generally on a lower floor of the building, is mounted a lower frame 7. Figure 2 shows that a vertical supporting and housing tube 8 has its lower end mounted on the frame 7. A platform 9 is mounted on the upper end of the tube 8 (Fig. 4), the necks 6 of the hoppers 5 extending downwardly through the platform.

A bearing frame 10 is carried by the upper ends of the hoppers 5, a vertical driven shaft 11 being journaled in the frame and in the platform 9. The shaft 11 extends downwardly through the housing tube 8, and its lower end is operatively connected with a gear mechanism 12 (Figs. 2 and 1), including a horizontal shaft 14 to be alluded to hereinafter.

By means of chain and sprocket drives 15, located within the frame 10, the shaft 11 is connected to shafts 16, extended downwardly through the hoppers 5 and their necks 6 (Figs. 4 and 2). Universal joints 17 are interposed in the shafts 16, where the body portions of the hoppers 5 merge into the necks 6. The shafts 16 carry feed worms 18, operating in the hoppers 5 and in the necks 6 thereof.

Parallel, horizontal receivers 19 and 20 (Fig. 3) are disposed above the lower frame 7 (Fig. 1), the receivers being provided intermediate their ends with upstanding inlet sleeves 21 (Fig. 5), communicating at their lower ends with the hopper necks 6, and held thereon by any suitable fastening means 22. The receiver 19 gets meat from the mechanism shown at 2, by way of one of the hoppers 5, and the receiver 20 gets mush, from the mechanism shown at 3, by way of the other hopper 5.

The receiver 19 has any desired number of side outlets 24, spaced apart horizontally, one of the outlets being seen to best advantage in Fig. 5.

The outlets 24 are prolonged through a housing 25, secured to the receiver 19. Downwardly extended and forwardly prolonged spouts 26 are secured to the housing 25 and form continuations of the outlets 24. There is a gate valve 27 for each outlet 24, the gate valve having sliding movement in a recess 28 (Fig. 5) located in the receiver 19, ahead of the housing 25. A plurality of coaxial shafts 29, located one within the other, are mounted to rotate in the housing 25, the shafts having individual handles 30 or other operating means, external to the casing 19 and located at one end thereof. Pinions 31 are secured to the shafts 29 (Figs. 5 and 6), and mesh with racks 32 on the gate valves 27.

The mush receiver 20 is a substantial duplicate of the meat receiver 19, the numeral 33 applied to the handles of the mush receiver in Fig. 3 being sufficient to indicate the duplication referred to. The spouts 34 of the mush receiver 20 extend under the meat receiver 19, as best shown in Fig. 5. The spouts 26 of the meat receiver 19 enter the spouts 34 of the mush receiver 20, and are prolonged longitudinally thereof. The construction is such that there is discharged from the spouts 34, a mingled mass of meat and mush.

Referring to Fig. 3, it will be noted that three trains of tamale material are discharged, but a construction is afforded whereby a single train of mingled mush and meat may be laid down. Under such circumstances, recourse is had to the structure shown in Figs. 7 and 8. In those figures, parts hereinbefore described have been designated by numerals already used, with the suffix *a*.

The meat receiver 19*a* has a single outlet 26*a* and the flow is governed by a single rotary valve 35. The corresponding mush receiver, marked by the numeral 20 in Fig. 3, is a duplicate of the receiver 19*a*, the spout construction 26—34 of Fig. 5 being retained.

By a proper manipulation of the gate valves 27 of Fig. 5, a single line of tamale material may be deposited: but if the purchaser does not desire a machine having the capacity of the one shown in Fig. 3, the mechanism appearing in Fig. 6 may be replaced by the mechanism depicted in Figs. 7 and 8. The valve mechanism shown in Figs. 5 and 6 is preferable when a soft material is being handled, but the valve mechanism shown in Figs. 7 and 8 perhaps is more satisfactory when a harder substance is being handled.

As the tamale material 39 (Fig. 2) leaves the spouts 34, it is deposited on long strips 36 of wrapper, such as paper, carried by spools 37, mounted for rotation on a hanger 38 (Fig. 1) supported from the platform 9. The strips 36 of wrapper, carrying the ejected tamale material, are moved lengthwise of the machine, by a mechanism to be described hereinafter.

The tamale material 39, having been deposited on the wrapper 36, moves through tapered folders 40 (Fig. 2), mounted on the lower frame 7. For convenience in cleaning, and for other purposes, the folders 40 are composed of laterally separable parts 41, as indicated by the numeral 43 in Fig. 9. Referring to Fig. 3, the folders 40 are open throughout the major portion of their length, but at their delivery ends, they overlap, in spaced relation, at the top, as shown at 42 in Fig. 9, to permit the ready passage of the wrapper 36. As the tamale material 39 moves through the discharge ends of the folders 40, it is given a cylindrical section, and the wrapper 36 is engaged about it, transversely.

The means for advancing the wrapper 36 and the tamale material 39 is not broadly new, since major portions of it appear in our former Patent No. 1,654,871, granted on the 3rd day of January, 1928.

As to the means for advancing the tamale material 39, enclosed in the wrapper 36, a gear casing 44 is disposed alongside the lower frame 7. A lower transverse shaft 45 (Figs. 2, 10 and 11) is journaled in the gear casing 44. An idle shaft 46 (Fig. 2) is supported for rotation on the lower frame 7. The shafts 45 and 46 carry sprocket wheels 47, about which is engaged a lower slat conveyer 48, disposed in line with the folders 40.

An upper shaft 49 is disposed parallel to the shaft 45 and is journaled in the gear casing 44. The shafts 45 and 49 are operatively connected by intermeshing gears 50, shown in Figs. 10 and 11. Forwardly extended radius arms 51 are mounted to swing vertically on the shaft 49. A shaft 52 is journaled in the rear ends of the radius arms 51. The shafts 52 and 49 carry sprocket wheels 53. The sprocket wheels 53 are engaged by sprocket chains 54, connected by outwardly extended transverse ribs 55. A pinion 93 is secured to the shaft 45.

When the shaft 45 is rotated, rotation is imparted to the shaft 49 by way of the gears 50. The wrapped tamale material is engaged between the lower conveyer 48 and the ribs 55 on the sprocket chains 54, and the wrapped tamale material is advanced, the radius arms 51 and associated parts having up and down swinging movement on the shaft 49. Especial attention is directed to the fact that the mechanism under consideration does more than advance the wrapped tamale material, in that, as shown in Fig. 2, the ribs 55 on the lower runs of the chains 54 put transverse creases 56 into the tamale material.

The next job that the machine does is to sever the wrapped tamale material at spaced creases 56, leaving two tamales joined together at an intervening crease, it being possible to fold the two tamales together, at an intervening crease, and put them in a can or other container.

The severing of the tamale material is done by a radial knife 57, best shown in Fig. 11, and mounted on a roller 59, the knife 57 cooperating with a lower roller 60. The roller 59 is carried by a shaft 61, journaled in the gear casing 44.

Figures 10 and 11 disclose that a pinion 62 is secured to the shaft 61, and meshes with a pinion 63 mounted to turn on a stub shaft 64 carried by the gear casing 44. The pinion 63 meshes with a gear wheel 65, journaled on a stub shaft 66 carried by the casing 44. The gear wheel 65 meshes with a pinion 67 on a transverse shaft 68, constituting part of a gearing mechanism 70 of standard construction, supported below the frame 7. The construction of the gearing mechanism 70 is such that the shaft 68 of the gearing mechanism is operatively connected to a shaft 71 (Fig. 1) disposed at right angles to the shaft 68 and forming part of a motor 72, supported below the frame 7.

The lower roller 60 of Fig. 11, which cooperates with the knife 57 on the roller 59, is carried by a transverse shaft 73, journaled on the gear casing 44 and on the lower frame 70. Motion is transmitted to the shaft 73, from the shaft 61, by a pinion 74 on the shaft 73, meshing with a

gear wheel 75 on the shaft 61, the pinion 74 and the gear wheel 75 being external to the casing 44, as Fig. 11 will show. The construction is such that the rollers 59 and 60 rotate in opposite directions.

Figure 2 shows that two connected tamales 77, which have been severed from the string of tamales at their left hand end, pass under a feed roller 76, before the said connected tamales are cut free at their right hand ends, from the string of tamales, by the action of the knife 57 of Fig. 11. The roller 76 is spool-shaped, to keep the tamales in line. A guide plate 77' supports the tamales in their passage from the knife 57 to a conveyer 78 to be alluded to hereinafter. Due to the operation of the roller 76, the left hand end of the two connected tamales has been delivered on the conveyer 78. The feed roller 76 is supported for rotation in the gear casing 44 and receives motion from the gear wheel 65, by way of an intermeshing pinion 79 on the shaft 76'.

It appears from Fig. 2 that the two severed tamales, marked by the numeral 80 in that figure, have passed onto the belt conveyer 78, hereinbefore mentioned. The forward portion of the belt conveyer 78 is carried (Fig. 1) on a roller 81, supported for rotation on the frame 7. The rear portion of the belt conveyer 78 is passed around a drive roller 82 (Fig. 2). The drive roller 82 for the conveyer 78 is attached to a horizontal transverse shaft 83 supported for rotation on the casing 11, externally thereof (Fig. 10). It appears in Fig. 12 that the shaft 83 gets rotation from the shaft 73 by a chain and sprocket connection 84.

By means of beveled pinions 85, the shaft 83 transmits rotation to a vertical shaft 86, supported at 87 on the casing 44 for rotation.

In Fig. 3, the numeral 88 marks a can conveyer disposed longitudinally of the tamale conveyer 78, at one side thereof. The can conveyer 88 need not be described in detail, because it is of the sort shown in Patent No. 2,181,659, issued on November 28, 1939, to Ben Harve Johnson, one of the inventors in the present application. Let it suffice to state that the can conveyer 88 includes a vertical shaft 89, connected to the shaft 86 by a chain and sprocket drive 90.

Referring to Fig. 2, the gearing mechanism shown at 70 comprises a horizontal shaft 91, connected to the shaft 14 by a speed change mechanism 92, of standard construction, and under the control of an operator, it being possible, thus, to regulate the operation of the feed worms 18 of Figs. 4 and 2, considered relatively to the remaining portions of the machine.

The driving train for the worms 18 of Figs. 4 and 2 comprises the shafts 16, the chain and sprocket drives 15, the shaft 11, the gearing in the casing 12 (Fig. 2), the shaft 14, the speed change mechanism 92, the shaft 91, the gearing indicated at 70, the shaft 71, and the motor 72.

The lower conveyer 48 of Fig. 2 receives motion from a train of parts comprising one of the sprocket wheels 47, the shaft 45, the pinion 93 of Fig. 10, the gear wheel 65, the pinion 67, the shaft 68, the gearing 70, the shaft 71 (Fig. 1), and the motor 72.

The sprocket chains 54 and the ribs 55 (Fig. 2), which cooperate with the lower conveyer 48, receive motion from one of the sprocket wheels 53, the shaft 49, the intermeshing gear wheels 50 of Fig. 11, the shaft 45, and the hereinbefore mentioned driving means for the shaft 45.

The upper roller 59 of Fig. 11, which carries the knife 57, receives rotation by a train of parts including the shaft 61 of Fig. 10, the pinion 62, the pinion 63, the gear wheel 65, the gear wheel 67, the shaft 68 and the intervening parts hereinbefore described and capable of being traced back to the motor 72.

The roller 60 which cooperates with the knife 57 on the roller 59 receives motion from the shaft 61, by way of the gear wheel 75 (Fig. 11) on the shaft 61, and the pinion 74 on the shaft 73, the drive for the shaft 61 having been traced out hereinbefore.

The feed roller 76 of Fig. 2 receives rotation (Fig. 10) by way of the pinion 79, the gear wheel 65, the pinion 67, the shaft 68, the gearing 70, the shaft 71 of Fig. 1, and the motor 72.

The tamale conveyer 78 of Fig. 2 receives rotation by way of the roller or pulley 82 the shaft 83 (Fig. 12), the chain and sprocket drive 84, the shaft 73, and parts hereinbefore described, whereby rotation is imparted to the shaft 73.

The can conveyer 88 of Fig. 3 is driven by a train of parts comprising the shaft 89, the chain and sprocket drive 90, the shaft 86, the beveled gears 85, the shaft 83, the chain and sprocket mechanism 84 of Fig. 12, the shaft 73, and parts hereinbefore described, and shown in Figs. 11 and 10, whereby rotation is imparted to the shaft 73.

The gross operation of the machine is as follows:

The mixing and cooking mechanisms 2 and 3 of Figs. 1 and 4, discharge their contents into the hoppers 5. By means of the feed worms 18, the ingredients are forced downwardly through the hoppers 5 and their necks 6, into the receivers 19 of Fig. 5 and 20 of Fig. 1.

Under the governance of the gate valves 27, controlled by the mechanism shown in Figs. 5 and 6, including the handles 30 of Fig. 6 and the handles 33 of Fig. 3, the material traverses the respective spouts 26 and 34 of Fig. 5, and is discharged as indicated at 39 in Fig. 2, on the strips 36 of wrapper, moving lengthwise of the folders 40, the wrapper 36 being engaged about the tamale material, after the manner of Fig. 9.

The lower conveyer 48 of Fig. 2, together with the sprocket chains 54 and their ribs 55, advance the wrapped tamale material, the ribs 55 forming the transverse creases as shown at 56 in Fig. 2.

The knife 57 on the roller 59 (Figs. 11 and 2), cooperating with the roller 60, severs the wrapped tamale material at spaced creases 56 to form the pair of connected tamales shown at 80 in Fig. 2.

Before the pair of tamales shown at 77 in Fig. 2 have been cut free from the string of tamales, by the knife 57, the tamales shown at 77 are delivered on the conveyer 78 by the operation of the feed roller 76.

The conveyer 78 advances the pair of tamales shown at 80 in Fig. 2. The tamales 80 of the severed pair are folded together and are placed by an operator in cans carried by the can conveyer 88 of Fig. 3.

The machine functions to consummate the objects outlined in the opening portion of this specification and alluded to thereinafter.

Owing to the provision of the substantially vertical worm conveyers 18 of Figs. 4 and 2, a continuous and uniform pressure on the tamale material is obtained, as it is advanced, and caking and hardening in the chutes 5 and the necks 6 is avoided. The worm conveyers 18 also enable the tamale material to be ejected from the spouts 34 at high speed, the output of the machine being increased accordingly. The spout arrangement

shown at 26—34 in Fig. 5 brings about an adequate mixing of the tamale ingredients, before they are discharged on the wrappers 36.

Having thus described the invention, what is claimed is:

1. In a tamale machine, a material handling mechanism comprising upright hoppers having reduced depending necks, a frame disposed above the hoppers and forming a connection between the upper parts of the hoppers, feed shafts mounted to rotate in the frame and suspended therefrom, the shafts being extended through the hoppers and the necks, the lower ends of the feed shafts being free, feed worms carried by the feed shafts and located in the hoppers and the necks, the portions of the worms which are in the hoppers being of appreciably less diameter than the hoppers and being spaced therefrom, the portions of the worms which are in the necks engaging the necks to form the sole bearings for the free lower ends of the feed shafts, a substantially vertical driven shaft supported for rotation between the hoppers, and driving connections between the driven shaft and each feed shaft, the driving connections being located within the frame.

2. In a tamale machine, a material handling mechanism comprising upright hoppers having downwardly converging longitudinal axes and provided at their lower ends with parallel, reduced depending necks, feed shafts each extended through the hoppers and the necks, the upper portions of the feed shafts being located in the axes of the hoppers, universal joints interposed in the feed shafts and located at the places of juncture between the hoppers and the necks, feed worms carried by the feed shafts, the upper portions of the worm being located in the hoppers, in spaced relation thereto, the lower portions of the worms being free, and being received closely, but for rotation, in the necks, to maintain the upper portions of the feed shafts in the stated relation with respect to the hoppers, a substantially vertical driven shaft supported between the hoppers for rotation, means for connecting the upper portion of the driven shaft operatively with each feed shaft, and means for suspending the feed shafts from their upper portions.

3. In a tamale machine, a material handling mechanism comprising upright hoppers, feed worms located in the hoppers, a driven shaft located between the hoppers, means for connecting the upper portion of the driven shaft operatively with the upper portions of the feed worms, and a box-like frame at the upper ends of the hoppers and so located as to prevent a fouling of said means by material discharged into the upper ends of the hoppers, the feed worms and the shaft being supported for rotation in the frame.

JOSEPH A. GAGE.
BEN HARVE JOHNSON.