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CONTAINER FORMING MECHANISM

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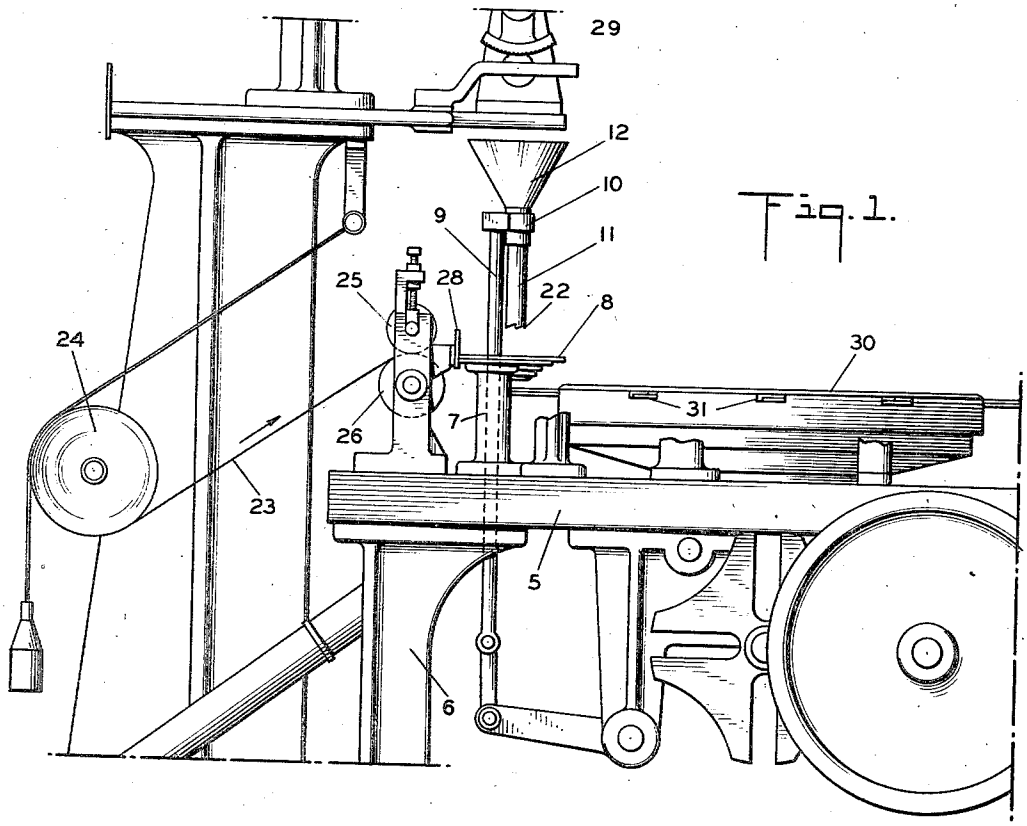


Fig. 1.

Fig. 2.

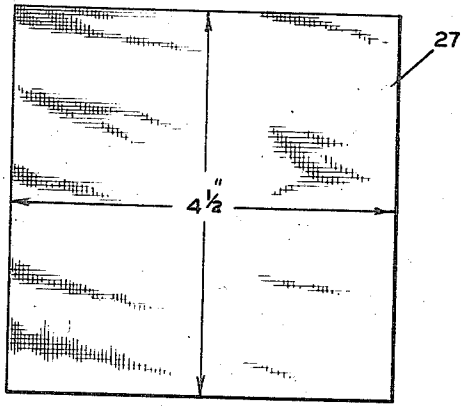
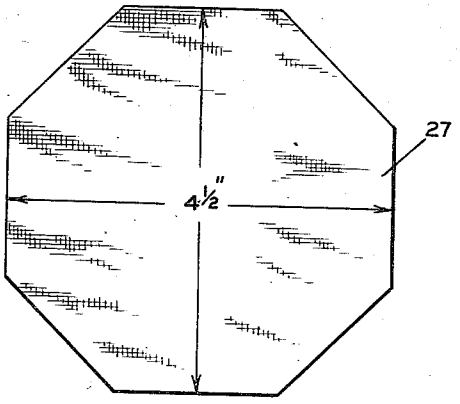


Fig. 3.



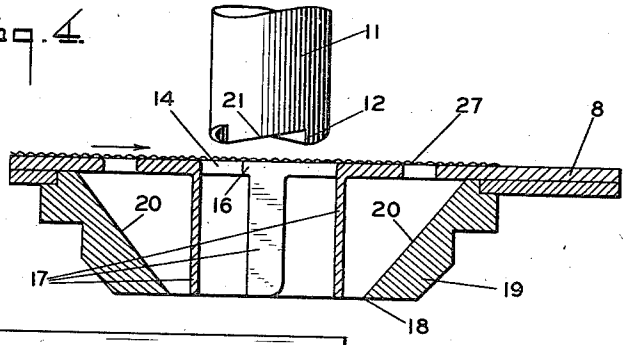
INVENTOR
MARTIN HERES
BY
William G. Mitchell
ATTORNEY

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CONTAINER FORMING MECHANISM

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Fig. 4.



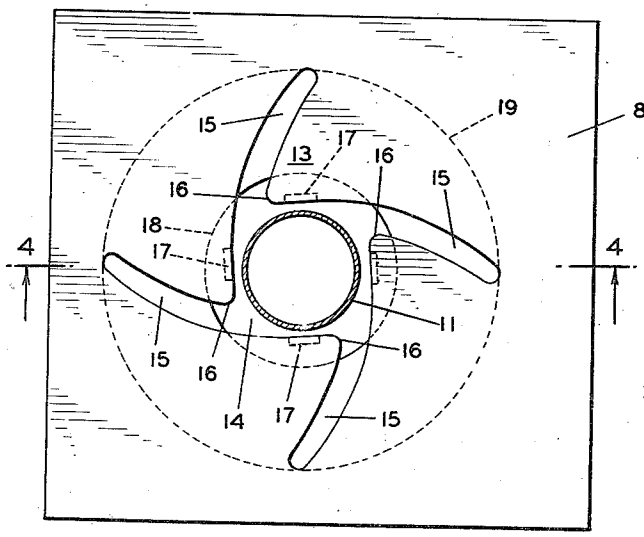


Fig. 5.

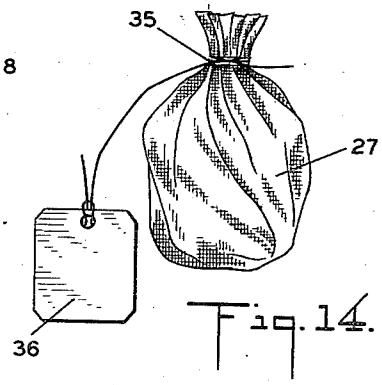


Fig. 14.

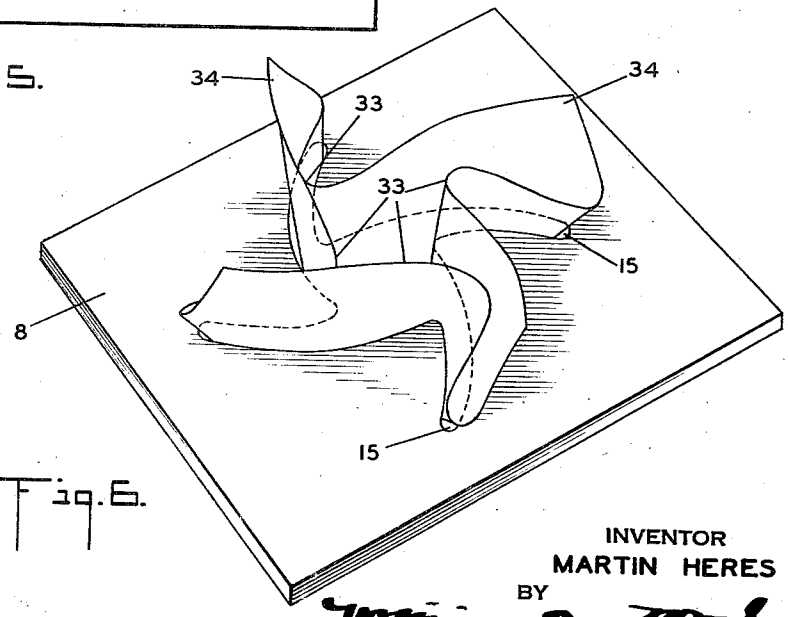


Fig. 6.

INVENTOR
MARTIN HERES
BY
William O. Tinn
ATTORNEY

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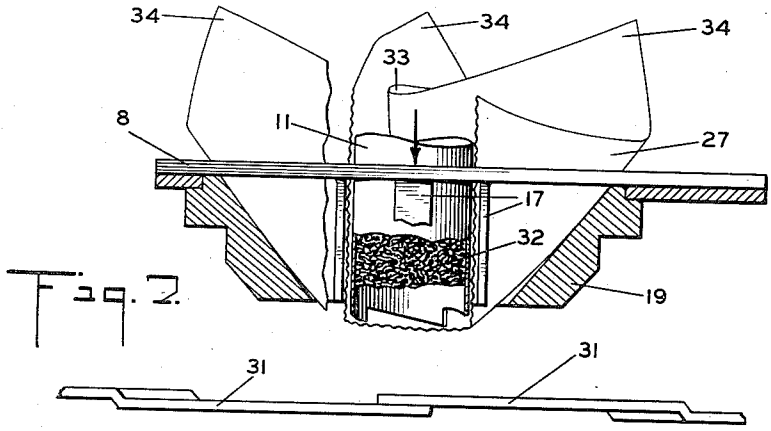


Fig. 7.

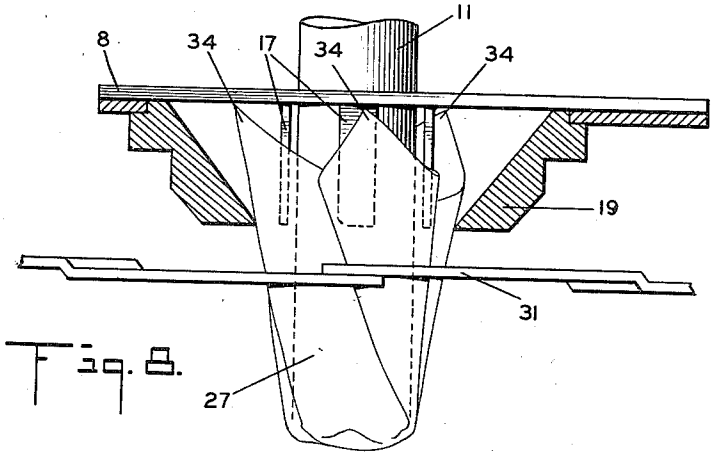


Fig. 8.

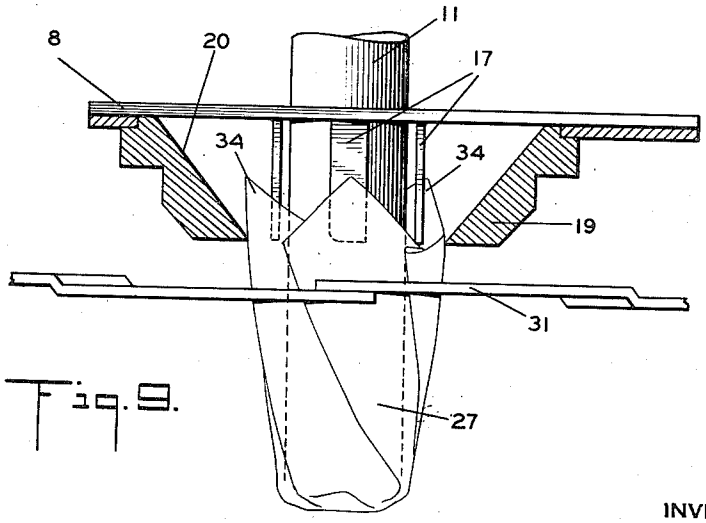


Fig. 9.

INVENTOR
MARTIN HERES
BY
ATTORNEY

Nov. 14, 1939. M. HERES 2,179,742

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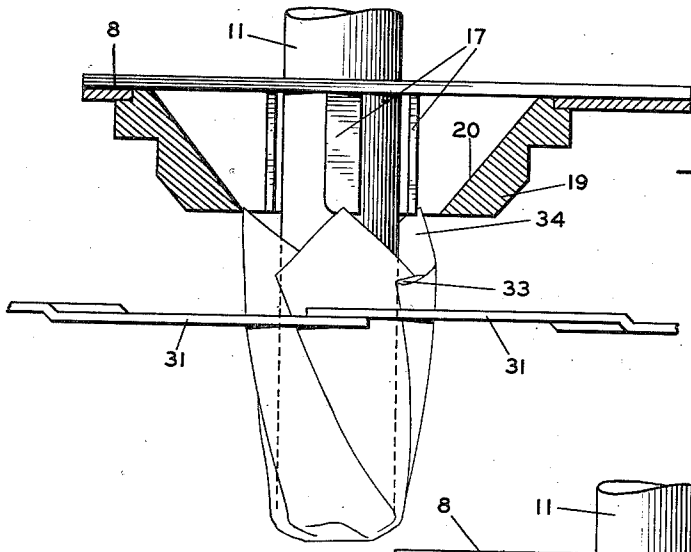


Fig. 10.

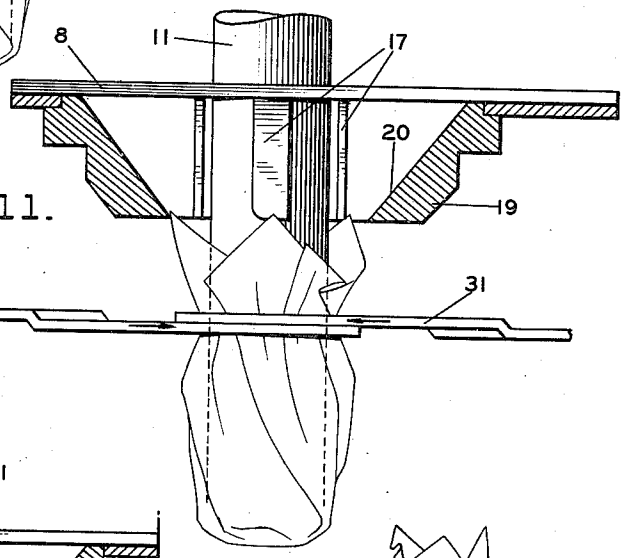
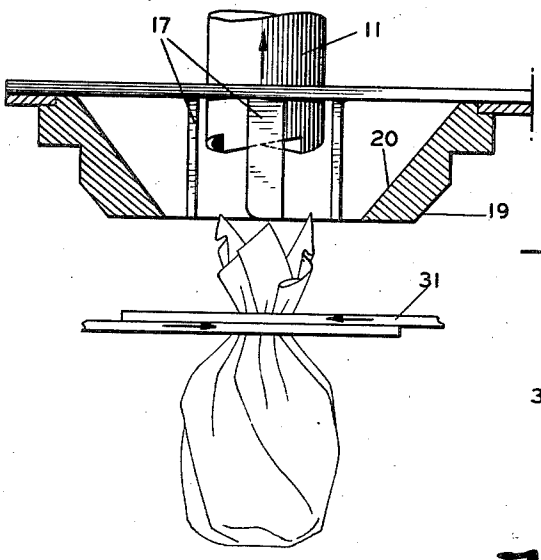


Fig. 11.

Fig. 12.



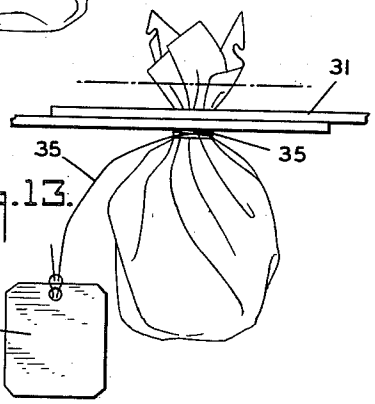


Fig. 13.

INVENTOR
MARTIN HERES
BY
Virnie G. Mud.
ATTORNEY

Patented Nov. 14, 1939

2,179,742

UNITED STATES PATENT OFFICE

2,179,742

CONTAINER FORMING MECHANISM

Martin Heres, Elmhurst, N. Y., assignor to Eppens, Smith Company, Inc., New York, N. Y., a corporation of New Jersey

Application March 15, 1938, Serial No. 195,999

4 Claims. (Cl. 93—3)

This invention has to do in a generic sense with container forming mechanism.

By way of example, I have selected the tea bag art. In the manufacture of containers typified by this industry, the production of the commodity is usually on a vast scale—running into the millions. The item of expense is manifestly important, and it is in connection with this that my invention is essentially directed. Succinctly, I contemplate an economy in the gauze or other fabrics which go to make up the bags per se.

To the accomplishment of the recited object and others co-ordinate therewith, one embodiment of my invention resides in the construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings and embodied in the scope of the appended claims.

In said drawings, Fig. 1 is a side elevation of a conventional type of tea ball machine, showing the application of the invention.

Fig. 2 is a plan view of a gauze blank after it has been severed.

Fig. 3 is a similar view illustrating the contour of the blank subsequent to trimming.

Fig. 4 is a transverse view of the pattern plate and its accessories, with the lower extremity of the plunger in full lines, as taken along section 4—4 of Fig. 5.

Fig. 5 is a top plan view of the pattern plate, the plunger element being in section.

Fig. 6 is a perspective view of the plate, showing the position of the gauze, after it has been partially forced into the pattern.

Fig. 7 is an elevation, partly in section, illustrating the position of the gauze as it obtains in Fig. 6, with the closing jaws added.

Fig. 8 is a similar view showing the position of the gauze as it appears when its upper ends are just below the pattern plate.

Fig. 9 is a similar view with the upper extremities of the gauze shown just previous to their being emitted from the cone.

Fig. 10 is a similar view showing the position of the gauze as it passes from the cone and is about to be engaged by the closing jaws.

Fig. 11 is a view illustrating the gauze as it becomes initially engaged by the closing jaws.

Fig. 12 illustrates the final position of the closing jaws as the bag is closed.

Fig. 13 is a view similar to Fig. 12 showing the surplus quantity of gauze remaining after the bag has been tied, and ready for trimming, and

Fig. 14 is an elevation of the finished bag.

Referring more particularly to the drawings, 5 designates the bed of the machine with supporting legs, as 6. On top of the bed, and preferably towards one end thereof, is an upright 7 which sustains a horizontally disposed plate 8. Extending in line with upright 7 is a rod 9 having lateral yoke 10 carrying plunger tube 11 depending from hopper 12.

Plate 8, as best illustrated in Figs. 4, 5 and 6, may be square, rectangular or any other desired shape. Medially, it is cut-out to present an opening which somewhat simulates a quatrefoil denoted generally by the reference character 13, and comprising a central opening 14 with equidistantally spaced arcuate foils or slots 15—in the present instance, although the number may be varied at will. For the sake of clarity, this quatrefoil is styled a pattern or die.

Depending from the inner angles 16 of the walls bounding opening 14 are vertical guides 17 which extend to a point coincidental with the lower edges 18 of collar 19. Internally, this collar is in the form of an inverted truncated cone with walls 20 spaced from guides 17; positioned directly beneath slots 15; and being inclined and converging downwardly towards the distal ends of said guides.

Lower edge of plunger 11 has a ratchet-like contour with inclines 21 and projections 22, corresponding numerically to the slots in the pattern plate.

Gauze 23 is designed to pass from the roll 24 through feed-rolls 25 and 26, and severed into blanks, as 27, by knife 28. This means, as well as the mechanism for delivering and measuring a predetermined quantity of some commodity—shown at 29; means for closing the filled container—comprising turntable 30 carrying clamping jaws 31; and tieing and tag affixing apparati constitute no part of this invention, and only such parts are shown diagrammatically as will enable one skilled in the art to gain a clear understanding of the operation of my improvement.

In operation, gauze 23 is severed by knife 28 into rectangular blanks as 27. Each blank assumes a position in superposed relation to the top of plate 8, and is centered to a nicety, as illustrated in Fig. 4. As plunger 11 descends, pointed projections 22 thereof engage the fabric and constrain the latter into the opening 14 and slots 15 of the pattern plate, thereby initially preforming the blank—see Fig. 6. Simultaneously, a predetermined quantity of some commodity, for example, tea 32 (see Fig. 7) is deposited in the pocket thus formed. Plunger 11 proceeding in its downward path, and the sharp, though not

too sharp, serrated edges thereof still impinging against and holding the fabric, causes the short ends **33** thereof to follow vertical guides **17**, and the long ends **34**, to traverse the inclined walls **20** of collar **19**, with the result that, when the fabric reaches the position shown in Fig. 8, long ends **34** overlap and lie contiguous short ends **33**. This movement is unique in that, while the plunger element moves in a vertical plane, and the preforming pattern remains stationary, the fabric itself is virtually subjected to a spiral movement.

The partially formed bag, exhibited in Figs. 8 and 9, continues to emerge from collar **20** and as this operation proceeds the upper extremity of the fabric is grasped by the oppositely disposed coacting jaws **31**, mounted on the turntable **30**, until the neck of the bag is brought together, see illustration Fig. 12. The surplus fabric is trimmed, the blank shown in Fig. 3 illustrating the resultant contour. In this form the neck is tied with a suitable string **35**, and if desired, the string may be provided with a tag **36**.

Heretofore, the production of tea bags has entailed the use of fabric measuring five and one-eighth inches square. With my invention the dimensions of the fabric are reduced to four and one-half inches square, and the bag or container holds as equal amount of the commodity—tea. When it is taken into consideration that containers of this type are manufactured by the millions, it will be seen that the saving thus effected is a very material one. Moreover, my improvement has the capital advantage of being extremely simple in construction, and requiring only a nominal outlay for its adaptation to machines already on the market.

In its broader aspects my invention comprehends the employment not only of the various means described, but of equivalent means for performing the recited functions. It is desired to reserve the right to effect such changes as may come fairly within the scope of the appended claims.

I claim:

1. An apparatus of the class described, comprising, in combination, a plate having an opening merging into a plurality of curved slots, vertical guides depending from said plate, a unitary collar disposed beneath the plate and surrounding said guides, the inside of the collar having a continuous inclined wall, and a plunger operable through the opening.

2. An apparatus of the class described, comprising, in combination, a plate having an opening merging into a plurality of curved slots, vertical spaced guides depending from said plate, a unitary collar disposed beneath the plate and surrounding said guides, the inside of the collar having a continuous inclined wall, converging towards the outer free terminals of said guides, and a plunger operable through the opening.

3. An apparatus of the class described, comprising, in combination, a plate having an opening merging into a plurality of curved slots, vertical guides depending from said plate, a unitary collar disposed beneath the plate and surrounding said guides, the inside of the collar having a continuous inclined wall, the lower terminals of the guides and the bottom edge of the collar being co-extensive, and a plunger operable through the opening.

4. An apparatus of the class described, comprising, in combination, a plate having an opening merging into a plurality of curved slots, vertical guides depending from said plate, a unitary collar disposed beneath the plate and surrounding said guides, the inside of the collar having a continuous inclined wall, the lower terminals of the guides and the bottom edge of the collar being co-extensive and spaced from each other, and a plunger operable through the opening.

MARTIN HERES.